NO. 50 SPRING 1986 $4.50 (CANADIAN $5.50)

WHOLE EARTH Review

ACCESS TO TOOLS AND IDEAS

PEERING INTO THE AGE OF TRANSPARENCY

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LIFE IN HELL

CHAPTER 1: UP AND AT 'EM!

CHUCKLING TOO INTENSELY AT THIS COMIC STRIP COULD RESULT IN EARLY TERMINATION

QUESTIONS

WHAT DO I WANT TO BE IF I GROW UP? WHY WOULD ANYONE WANT TO HIRE ME? WHAT IF I MAKE THE WRONG CAREER CHOICE? WHAT IF I DON'T LIKE MY JOB? HOW COME I HAVE SUCH BAD LUCK? HOW CAN I GET RICH? DOES LIFE HAVE TO BE THIS TEDIOUS? WHEN IS MY COFFEE BREAK? WHY ME?

ANSWER: GET BACK TO WORK.

THE FACE OF WORK

READ 'EM. MEMORIZE 'EM. FILE 'EM.

WORK PROVERBS

IT'S A DOG-EAT-DOG WORLD OUT THERE.

TIME IS MONEY.

YOU CAN'T GET HIRED UNTIL YOU'RE EXPERIENCED, AND YOU CAN'T GET EXPERIENCED UNTIL YOU'RE HIRED.

A RAISE? YOU'RE LUCKY WE DON'T FIRE YOU.

GET BACK TO WORK.

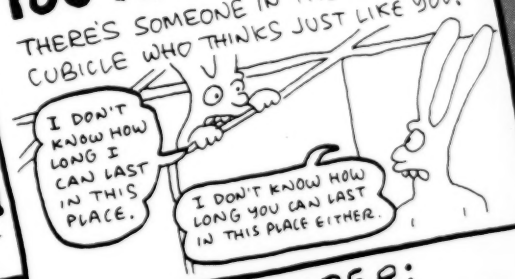
BASIC WORK TOOLS

YOU WILL NEED:

THE BENEFITS OF WORK

YOU ARE NOT ALONE

THERE'S SOMEONE IN THE NEXT CUBICLE WHO THINKS JUST LIKE YOU.



WORKER'S DIARY

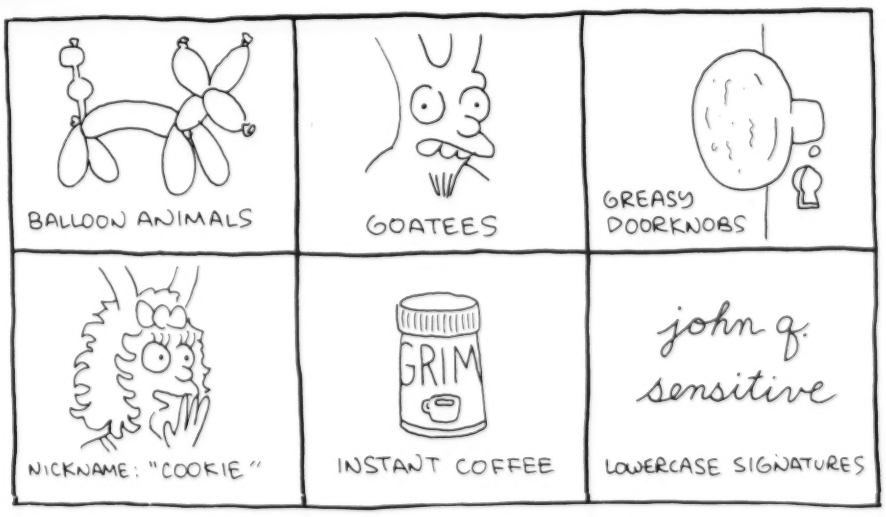
MON Got up. Went to work. Came home. Watched TV. Went to bed.	TUE Got up. Went to work. Came home. Watched TV. Went to bed.	WED Got up. Went to work. Came home. Watched TV. Went to b d.	
THU Got up. Went to work. Came home. Watched Tv. Went to bed.	FRI Got up. Went to work. Cashed paycheck. Came home. Got drunk.	SAT Don't remember.	SUN Don't remember.

JUST REMEMBER:

IF YOU DON'T LIKE IT

NEXT: MORE OF THE SAME.

UNDERPAID IN HELL WARNING SIGNS



©1985 BY MATT GROENING

SO YOU WANT TO BE AN UNRECOGNIZED GENIUS

WHAT KIND OF GENIUS ARE YOU?

CONSULT THIS HANDY CAREER-GUIDANCE CHART

IF YOU LIKE	BUT YOU DON'T LIKE	THEN YOU CAN BECOME
IMAGES	SECURITY WELL-BEING JOLLITY	A POWERFUL PAINTER
SOUNDS	COMFORT DREAM VACATIONS FUN	A UNIQUE COMPOSER
WORDS	FRIENDS MONEY BEING UNDERSTOOD	A DELICATE POET

TELLTALE SIGNS OF GENIUS

- GREASY FUR
- SPLITTING HEADACHES
- DARK CIRCLES UNDER EYES
- NERVOUS TWITCHES
- HAUNTED LOOK
- MUTTERING OF PROFANITY
- GROWLING
- STALE BODY ODOR
- PERMANENT SLOUCH
- LOTTERY TICKETS

WHAT TO TALK TO YOURSELF ABOUT

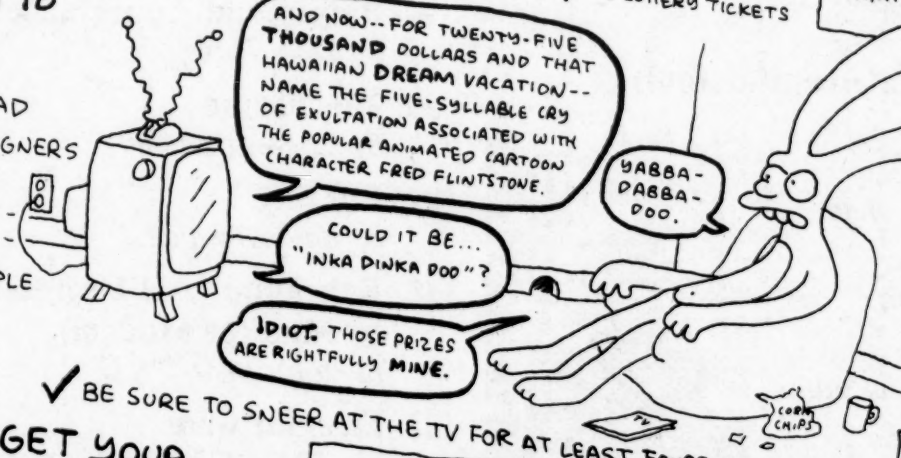
- ☐ BIZARRE CONSPIRACY THEORIES
- ☐ LOWER BACK PAIN
- ☐ HOW STUPID EVERYONE IS
- ☐ HOW THE WORLD CAN GO TO HELL FOR ALL YOU CARE
- ☐ WHAT YOU'RE GOING TO DO WHEN YOU GET A MILLION DOLLARS

WHAT THE WELL-DRESSED GENIUS IS WEARING

GENERALLY, FASHIONS AND HAIRSTYLES THAT WERE POPULAR APPROXIMATELY A DECADE AGO

THINGS TO HATE

1. MOM
2. DAD
3. GOD
4. FOREIGNERS
5. HIGH SCHOOL
   - A. THE TEACHERS
   - B. THE PHONIES
   - C. THE PROM
6. TV
7. RICH PEOPLE
8. YOUR BOSS
9. YOUR FRIENDS
10. HUMOR

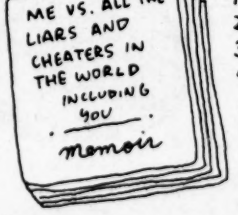


THE MANY MOODS OF THE GIFTED VISIONARY

- IRKED
- VEXED
- CRABBED
- PETURBED
- GLUM
- SURLY
- SNAPPY
- PEEVISH
- GRUMPY
- SULLEN
- SULKY
- SOUR
- DEADLY

✓ BE SURE TO SNEER AT THE TV FOR AT LEAST FOURS HOURS A DAY

DON'T FORGET YOUR SECRET PROJECT!!



1. MAKE PLENTY OF NOTES.
2. RUMINATE.
3. TAKE A NAP.
4. MAKE A LIST.
5. DRAW A DIAGRAM.
6. RUMINATE SOME MORE.
7. DON'T SHOW YOUR WORK TO ANYONE UNTIL IT'S FINISHED.

NOTE TO AUTHORS: FOR BEST RESULTS, TYPE YOUR MANUSCRIPTS SINGLE-SPACED WITH NO MARGINS USING AN OLD TYPEWRITER RIBBON. USE LOTS OF UNDERLINING AND EXCLAMATION POINTS, AND DON'T FORGET THOSE ALL-IMPORTANT SMUDGES AND COFFEE STAINS THAT SHOW THE CONSUMING INTENSITY OF YOUR INNER TORMENT.

THINGS TO DO TODAY

- ☐ GLARE AT SHOPPERS IN THE GROCERY STORE
- ☐ WRITE A FROTHING LETTER TO THE EDITOR
- ☐ MUMBLE MENACINGLY UNDER ONE'S BREATH AT THE LAUNDROMAT
- ☐ WALK OUT OF THE ART GALLERY OPENING IN A HUFF
- ☐ MASTURBATE GLOOMILY

PRACTICE YOUR AUTOGRAPH

FOR YOUR IMPENDING DAY OF FAME

Binky
Binky
Binky
Binky

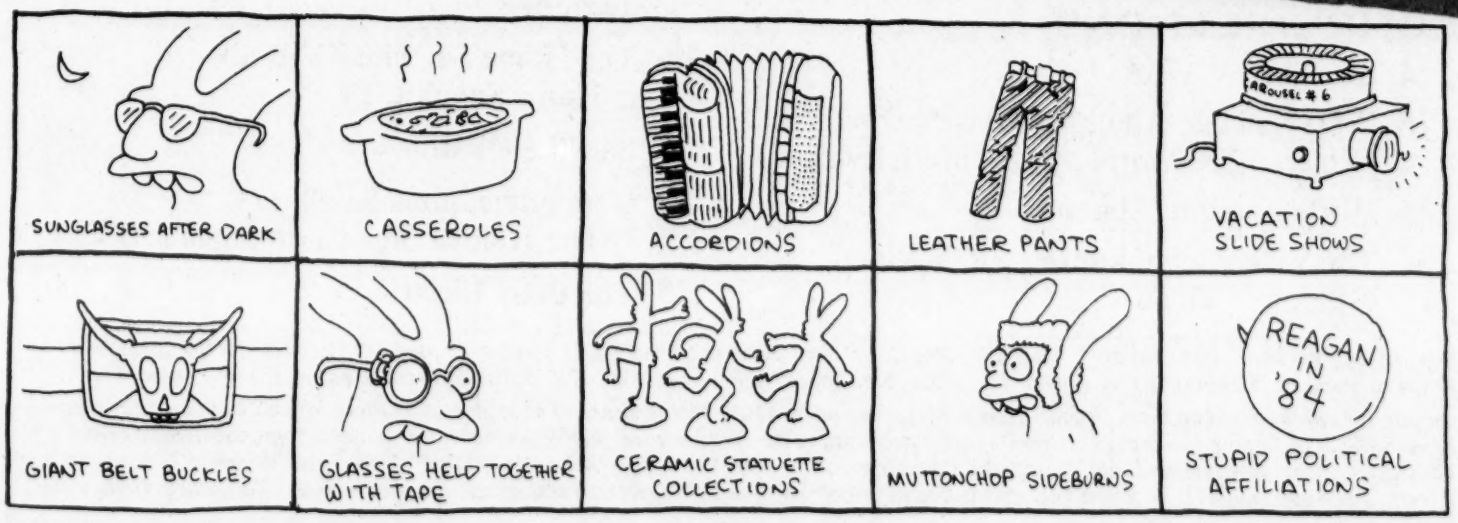
RAINY-DAY GENIUS FUN PROJECT

DEFACE PHOTOGRAPHS OF MODELS AND CELEBRITIES IN MAGAZINES.

THE SECRET MOTTO OF THE SECRET GENIUS

(TATTOOED ON ASS)

LIVE SLOW
DIE IN LATE
MIDDLE-AGE
LEAVE AN
ARTERIOSCLEROTIC
CORPSE



From Work is Hell, *$8.95 postpaid from Life in Hell, P. O. Box 36E64, Los Angeles, CA 90036 (or SASE for info on other books).*

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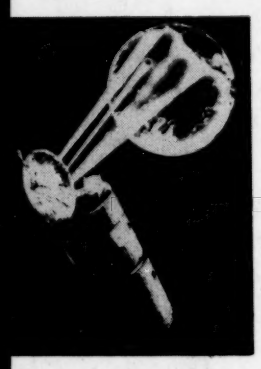

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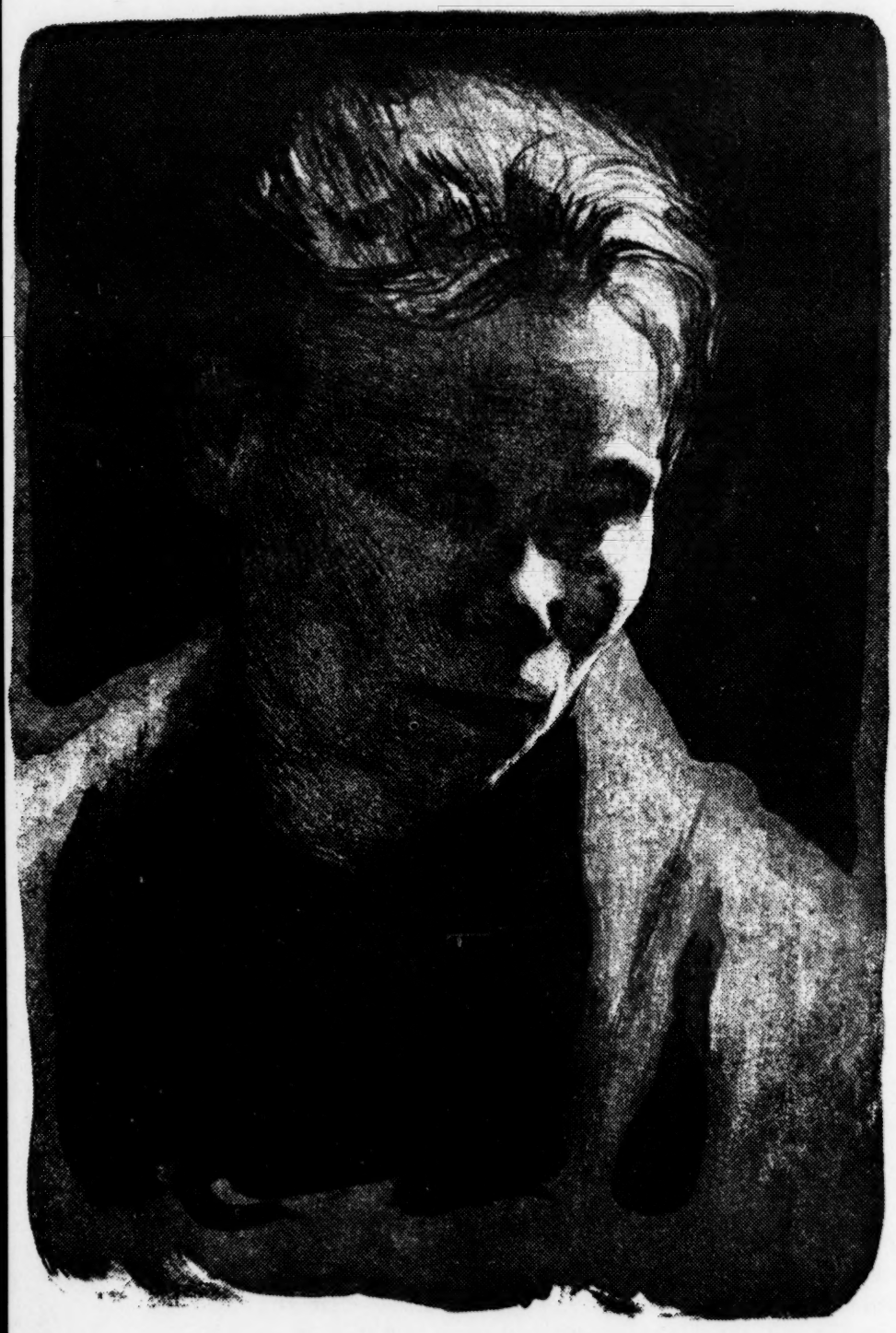
COVER: *"Get the best available satellite photo of Moscow as soon as you can, and take notes on how you did it," Kevin said. Here are my notes:*

Washington, D.C., 14 Jan.. Photo must reach WER *by 27 Jan. Can't use SPOT — launch delayed. Check Large Format Camera (LFC) data: did LFC cover Moscow? Manager says no. (LFC pix highest resolution commercially available: 10m. Inquiries: Martel Laboratories, 7100 30th Avenue North, St. Petersburg, FL 33710; 813/345-0100.) That leaves Eosat (nee Landsat). Library of Congress just got public inspection file for Landsat. Access system not fully functioning yet, but librarian helpful. Look up Moscow coordinates: 37° 37' E x 55° 45' N. For Landsats 1, 2 & 3 that's covered at Path 193, Row 21. For Landsats 4 & 5 . . . 4 & 5 listings not delivered yet, librarian says: problem with subcontractor. 4 & 5 yield sharper pix! (Kill subcontractor.) Stuck with 80m resolution. Check P193, R21 fiche cards. Several hundred views in stock. Note scene # and picture-file location for all with 0% cloud-cover and high tech-quality rating. Total: 11. Check microfilm picture file, see what they look like in b/w. Another subcontractor screw-up: cartridges with four of our possibles won't load into filmreader! Of remaining 7, majority shot in winter: snow-covered. In some Moscow cropped by frame. Best is scene #82230507500X0 (15 May 1981). No snow, good sun angle but quality of 2 spectrum bands only fair. Have to risk it. Call Landsat Customer Services, 605/594-6151. Color composite already generated for this scene? (Otherwise, add $300 to cost.) Yes! Fill out order form for one film positive in standard false color = $150, x 3 for expedited service (6 working days), otherwise 3 weeks if we're lucky. Total = $450. Mail with check to Eosat, EROS Data Center, Sioux Falls, SD 57198, 15 Jan. Call Eosat HQ, 301/552-0547 to get release to publish. No problem, no extra charge.*

This is far *from the best Moscow photo we could have gotten had we more time and money. Something from the Thematic Mappers on Landsats 4 and 5 is what we needed. But not only was the TM index temporarily unavailable here, TM pictures cost more than we could afford: $660 on film (if compositing needed), $1980 for expedited delivery. Sorry, Kevin, 'twas the best I could do.*

The digital image of Washington, D.C. was produced in July 1983 by SPOT Image Corporation using a multispectral scanner mounted aboard a Learjet. It simulates the 10- and 20-meter resolution imagery which will be acquired by the SPOT remote sensing satellites, to be available to U.S. users through SPOT Image Corporation, 1897 Preston White Drive, Reston, VA 22091. —*Robert Horvitz*

LET THE WITNESS STAND



"Woman with Blue Shawl" by Kathe Kollwitz.

THE JAILED CHRISTIAN resister responded cautiously to my letter requesting that we begin a kind of written dialogue about her "witness" — an act of civil disobedience concerning nuclear weapons. I was writing a book about war resisters including World War II conscientious objectors, Greenham Common peace camp participants, secular civil disobedients, and, I hoped, religious resisters. "I guess I kind of lean towards 'the anonymous monk of the fourth century' kind of work," she explained in that first letter of November 1983. Would I be willing to do the "anonymous monk" bit and talk only about resistance? I agreed, and our correspondence continued throughout most of the six-month sentence she had received after refusing probation, restitution, fines, and community service.

A year later, she was involved with three other Christians in another action at a missile silo. For this, her fourth action, she was sentenced to pay thousands of dollars in restitution and fines and received a sentence of 23 years in prison with five suspended if she agrees that she will not participate in such actions in the future. *—Holly Metz*

Why do you wish to remain anonymous?

I'm a bit leery of any attention paid to individuals in resistance, having seen too much of the cult of personality that develops when the focus is on the person and not on the truth of the witness. I think this is particularly important in Christian resistance. Who we are is totally unimportant. If in our witness we somehow illuminate the truth of Christ's peace, that is more than enough.

The term "resistance" as used by the Christian peace movement is taken from the admonition

---

This letter-interview came unsolicited in the mail. Nearly as anonymous as the respondent, the interviewer lives in Hoboken, New Jersey. *—Kevin Kelly*

of Saint Paul to "do good *and* resist evil." The point is that the doing of good, the "corporeal works of mercy" as the Church knows them (feeding the hungry, clothing the naked, visiting the prisoner), is only one side of the coin. It's a message most needed by modern Christians, most of whom can say, with some justification, that their personal lives are quite "good." Paul reminds us of our dual obligation in the word "resist," and so, the use of the term. I prefer it to "civil disobedience," for civil disobedience is usually seen as negative. "Divine obedience," which is positive, and resistance, which is the active engagement, seem to fit the bill perfectly.

As for the "cult of personality," I think history has shown the danger of leaders. I was reminded of this by a statement that the antinuclear movement needs to bring forth a Mahatma Gandhi or a Martin Luther King. Both of these great men were catapulted into positions of leadership by the charisma of their personalities, and people became attached to them rather than to the truth of the morality, spirituality, and nonviolence they preached. As soon as they were gone (prison and death) the movements they led died, and the people returned to conflict and violence. Gandhi said his followers caused him more anxiety and trouble than his British adversaries, and he died considering himself a failure because he had imparted to others only himself and not the love and nonviolence that could sustain them.

How does one encourage thought, prayer, and action in others without becoming a public figure?

Do what you do and then duck — quickly. The writing and/or speaking one does can be handled in the same manner, especially if done from prison since numbers and blue uniforms are a great equalizer. Resisters are neither saints nor sinners, nor are they to be emulated for their virtue or rejected for their shortcomings; sanctity, in any case, is the province of God and none of our concern. If the emphasis is on the truth of the witness, the answer to the question, "Who was that masked woman?" ought to be, "Who cares?"

All of this is decidedly "un-American," not the way of the prevailing culture with its *People* magazines and celebrity dolls. It takes a certain wariness and an occasional blunt NO. Jesus did it, constantly referring the truth, power and glory back to the Father. We can scarcely do less.

Why go to jail?

1. Going to jail is the inevitable outcome of taking responsibility for one's acts. The maneuvers that can keep one out of jail (deals with the prosecution; accepting fines, restitution, or probation; keeping the case in the courts on endless appeal for the purpose of avoiding punishment rather than continuing the statement of truth) would not sit well on my conscience.

2. As Thoreau said, when the true criminals (in our case the Reagans, Weinbergers and Joint Chiefs) are running around free, the only honorable place for a decent human being is in the prisons;

3. As a continuation of the witness;

4. As an embrace of the humility and vulnerability of Christ;

5. As a living-out of the fact that unearned suffering is always redemptive;

6. As a further exposing of the Beast;

7. In the mystical sense that great spiritual power is released by the mere presence of good in a place of evil, love amidst hatred;

8. The deliberate placing of one's life among the first victims of the Bomb, society's poor and outcast;

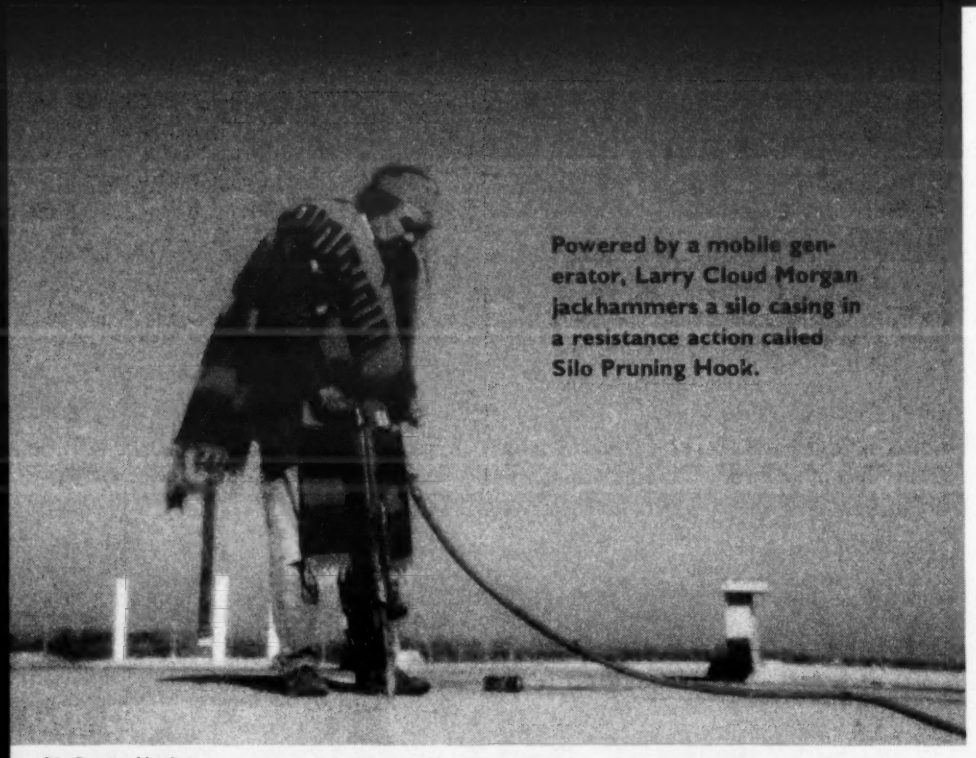
9. As a form of prayer, the modern desert monasticism.

When you plead guilty, aren't you agreeing with the government's interpretation of "criminal intent?"

The dictionary defines crime as "an act committed in violation of the law." My pleading guilty acknowledges that I did, with full intent, violate the law. In doing so, I accept no moral culpability, and so state that it is the *failure* to be guilty of breaking the law that makes one morally culpable. I take this stance because it's their law, not mine, and except for breaking it, I have no desire to be associated with it.

The view has been expressed by different resisters that harsh sentences heighten the contradiction made evident by their situation, such as peace camp participants being imprisoned for failure to "keep the peace."

In general, I'd say it's the *charges* rather than the sentences which heighten the contradiction, e.g., conspiracy and sabotage lodged against nonviolent people while international terrorism is labeled justifiable defense. Harsh sentences expose the system for what it is (intent upon its violent madness) and name the resister for what he/she is (a direct threat and challenge to that insanity). A personal quirk, but I prefer the honest, "hanging" hizzoner who does the bidding of his master to the liberal judge who tries to reduce the issue to nothing more than a polite difference of philosophical opinion. Gandhi once said the judge who truly represents the political power structure is duty-bound to punish those who confront that structure within the harshest limits of the law. I agree. Justice does not lie in lenient sentencing as a gesture of the sincerity and good will of the resister. Justice in the courts



Powered by a mobile generator, Larry Cloud Morgan jackhammers a silo casing in a resistance action called Silo Pruning Hook.

Silo Pruning Hook

can only come about if the judge is willing to leave the bench and join the resister in an act of conscience. I ain't seen it happen yet.

Are you a member of a particular church? And why?

I'm Roman Catholic and love the Church with all my heart. As a friend once said "She may be a whore, but she's our mother." Which is not, of course, to say that her sons and daughters need be bastards. The why is simple: Word, liturgy, sacrament, truth, life. Who can refuse such a gift?

In the New Testament, reconciliation is emphasized, not the overthrowing of one order for another. How does this apply to resistance to violence?

The electoral process simply supplants (legally and peacefully) one political structure for another; revolution puts into place (illegally and violently) a new hierarchy. Both require power and the manipulation of power to maintain themselves. Both require an enemy, an underdog, a win/lose scenario (moral, emotional and spiritual violence). Nonviolent resistance by its vulnerability and powerlessness calls for *mutual* repentance, conversion and healing, or reconciliation.

This element of reconciliation can easily be missed in a "mass movement" that sees civil disobedience as political tactic or strategy. The result is a peculiar marriage of the electoral and revolutionary (peaceful and illegal) processes without the heart of love and reconciliation. Even the smaller, spiritually-based resistance runs the risk of committing moral and spiritual violence unless the emphasis is clearly on the truth of nonviolence rather than upon us as individuals. Reconciliation, unlike the other processes, requires as much of us as it does of the "other." The result is community.

What is your opinion of the "just war" theory and its application? (I am thinking of the French bishops' statement that nuclear weapons are acceptable as a deterrent.)

Much more important for our discussion is the fact that the American bishops said the same thing. Simply put, "just war" is not Christian; it has no basis in the words or acts of the unilaterally disarmed Christ. It denies the Lordship of Christ and delays the Kingdom by its trust in earthly power and might. It is not even internally consistent: Just war is okay because the loss of innocent lives (the term "innocent life" is itself un-Christian; Jesus refused violence against the soldiers as well) is "indirect and unintended."

As the bishops mentioned in private discussion, to condemn all war and preparations for war would require naming as sinful all military service, work in military industries and payment of taxes. Too risky.

"Martyr" means witness, in Greek. In light of today's resisters, is the word martyr *applicable or appropriate?*

It ought to be appropriate and applicable. Martyrdom was the norm of a faith that, if lived obediently, was always in direct conflict with the illicit secular power structure. Only since Constantine, when the Church bought in to the imperial nation-state, has martyrdom ceased to be the expected outcome of Christian life. We resisters are in the process of buying out. That this witness will be required is indisputable; that any of us will be up to it remains to be seen.

Is a mass nonviolent movement, such as Gandhi described and helped enact in India, desirable, or possible, in the U.S. and worldwide?

Assuming (I do and will) that *true* nonviolence, the engagement of one's very life rather than a political tactic or strategy, requires a deep spiritual base — the willingness to literally "lay down one's life," an understanding and acceptance of redemptive suffering, and the sense that we're dealing with God's time, not a 5-year plan for success. No, a mass movement is not possible. What passes for it — low-risk actions, interchangeable bodies, the emphasis on action as media-event — has some initial educational value and can be considered a starting point for more serious resistance. But mass anything tends to have little depth and assuming (I do and will) that the Beast is deadly serious, we will need to come up with something worthy of the opponent.

Why did you choose a particular form of resistance (e.g., blood spilling) especially in certain places?

For most religious resisters, the particular form of a witness is determined by the symbols that speak to us most clearly of the heart of existence — life, death, resurrection. Bloodpouring expresses at once the horror of the death work of nuclear sites, the blood of Christ shed in redemption,

our own willingness to endure suffering rather than inflict it upon others, and our vital connection with all humanity in the beloved community. Other symbols spring from biblical texts, e.g., the use of hammers from the Isaiah injunction to beat swords into plowshares, or from the liturgy, e.g., the celebration of Eucharist (bringing life into a place of death) or ashes from burned money or tax forms in repentance for our misuse of resources and our complicity in nuclear murder. Some are dictated by a particular situation, e.g., the symbolic use of Interdict in response to the bishops' failure to condemn just war and nuclear deterrence.

The site is limited only by imagination since the nuclear monster has its tentacles everywhere, but the choice will determine the type of witness. For example, it would not be particularly meaningful (though lots of fun) to bash the White House with hammers, though nothing is more appropriate when faced with a Trident sub. Some differentiate between purely symbolic acts (blood pouring) and disarmament actions. I tend not to make this distinction for myself because none of us has ever confronted a live nuclear weapon, and, other than symbolically, I'm not sure what we could safely do with it if we were to do so. One form seems to lend itself more readily when the focus is on the human element, the second when the matter to be dealt with is the physical property itself. Both are essential. For most of us, the choice is made after much prayer, and if acting in community, through much reflection. Also essential is the element of celebration, play, and pure fun. Resistance is serious but seldom grim.

The trick is not to take yourself too seriously. When you get people conspiring together in celebration, you're going to have fun. I wouldn't act in situations where this element is missing.

Part of the ability to celebrate and have fun comes in the ability to renounce the fruits of one's actions, which is quite the opposite of the military, where the fruits are the only things that count (number of enemy killed, territory conquered). We know that life has already overcome death, love overcome hatred. Our individual acts will not end the arms race, but our love and fidelity and obedience will. So we can relax and enjoy. The fact that we do mystifies and sometimes angers others. I was once told by a Secret Service agent, "Stop grinning! You're in serious trouble." I'd never had so much fun in my life. It feels good to do good, even when handcuffed to a wall for four hours. So much of what we do stifles the human spirit. Most Americans hate their work (therefore ulcers, tranquilizers, early heart attacks) and hate their families (divorce, refusal to have children, child neglect and abuse). So many don't know why they live as they live except that everyone lives that way and it's hard

Helen Dery Woodson sledgehammers external pipes of a midwestern missile silo.

Silo Pruning Hook

to stop. Resistance begins with a kind of liberation from that spiritual death, and the feeling after acting is one of enormous freedom and joy.

Should acts of witness become "useful?" (That is "political" via exposure to the press, or as teaching devices, or to promote further discussion, and therefore, future actions?)

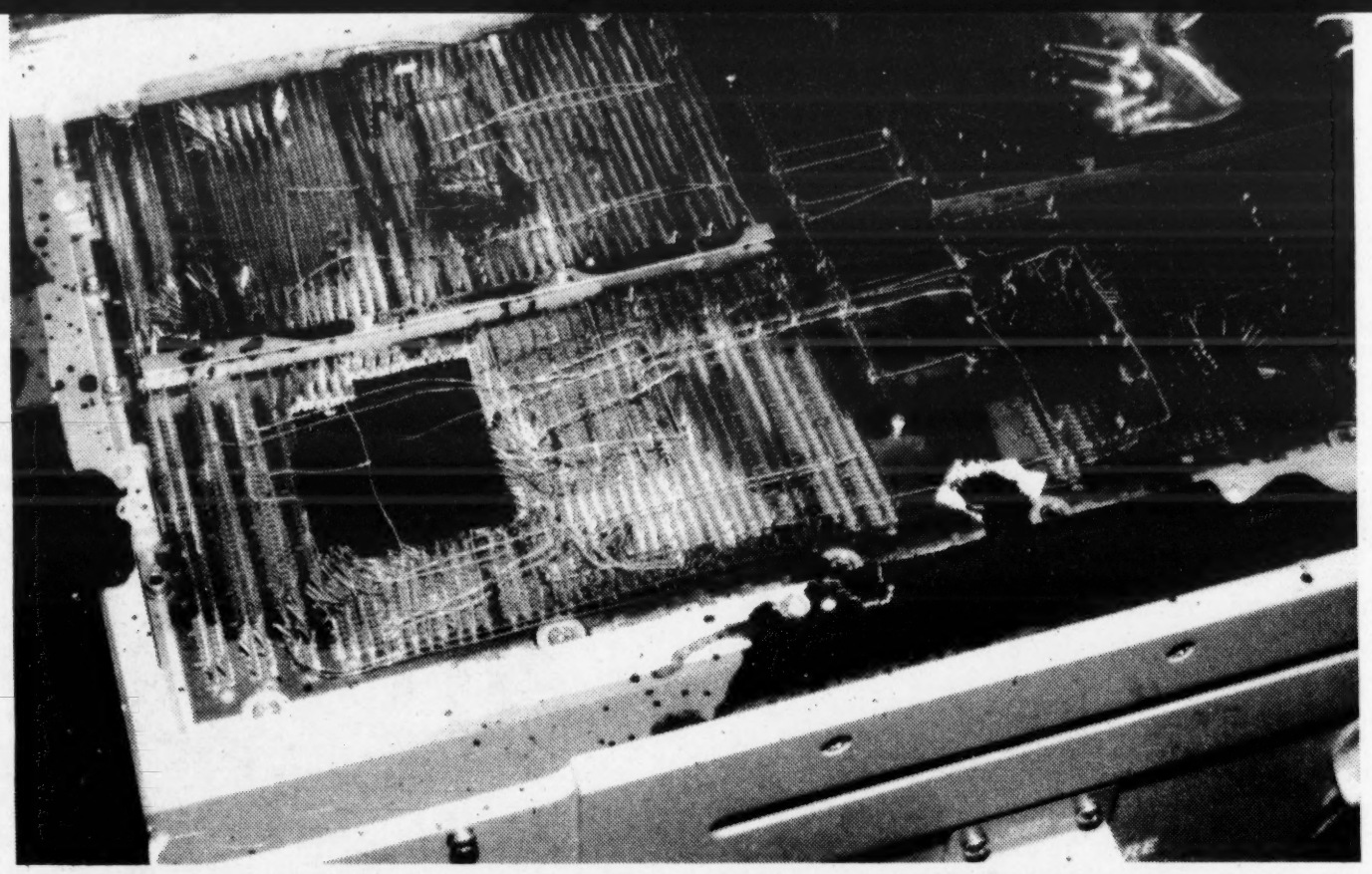
In the age of media, nothing done publicly (and little that's done privately) can escape becoming "political" or "useful." to make use of that exposure, to teach and promote disucssion is entirely appropriate, but that's a far cry from planning the witness as a media event (in which case it's not a witness at all). It doesn't even make sense. *The Day After* and Helen Caldicott on the Donahue Show reach millions; our seminars, discussion groups and newsletters reach thousands, and you don't have to do six months for them. An act of conscience is acceptance of personal responsibility for peacemaking, a confronting of the Beast with our lives, a statement of truth; its value lies within itself or not at all. To manipulate it into the arena of the political is to deny the power of God's grace to work its mysterious, mystical magic (as in the silent prayer of contemplatives or the suffering love of a slum worker who no one can name, as in the Chassidic legend of the Just).

You can bet that those who do the best job of making their witness useful are the ones who have their eye on the Spirit first and the TV cameras a distant second.

I don't place much emphasis on the interpreting and explaining of particular actions and witnesses so that they become "comprehensible" to the public (this as opposed to telling about the Bomb and the need for resistance in general, which I fully favor). Let the witness stand alone.

Why?

Lots of reasons. First, because I think it *can*



About $33,000 worth of damage was done with household hammers to a prototype navigation computer for an Air Force F4-6 fighter jet by John La Forge and Barb Katt. For ten months, they prepared for the action, surrender, interrogation, trial, conviction and prison term (six months, suspended). Photo courtesy of the FBI.

stand alone. The sight of a flag or presidential seal or Pentagon pillars and steps lying drenched in a pool of human blood is a very eloquent statement. That it is quite readily apprehended by those who see it is made clear by the insistence of the authorities in referring to "red paint" or a "red fluid." Likewise, the meaning of a smashed nosecone, B-52 bomber or Pershing missile launcher is unmistakeable, proved again by the authorities' frequent claim that there was no significant damage, nothing really happened.

But more. The age of communication and its technology is used to obfuscate rather than to clarify, to remove us from reality rather than to penetrate and illuminate reality. Endless talk abrogates the need for right conduct and action; people are lulled into a sense that they're doing something if they attend a seminar, read a book, question and listen to a resister.

In his book Faith and Violence, *Trappist monk Thomas Merton said of conventional struggle: "If the oppressed try to resist by force — which is their right — theology has no business preaching nonviolence to them."*

A sticky matter, certainly, and one we all deal with sooner or later, First, maybe, the distinction between understanding and condoning. Theft may be morally wrong (or prostitution or any one of a number of acts), but when the act is committed by a person in desperate need of money or goods to support life, it can be seen in a different light than if it is done in greed or malice. Second, we need to look at who caused the situation, where the violence originated. Since it is *our* violence to which the oppressed respond with force, it is morally difficult to hold them to standards of behavior that we ourselves refuse to follow. Not at all consistent.

But (with regard to the quote) I think I would put the emphasis on Merton's last premise, that theology has no business preaching nonviolence to them. I'd say that theology has no business preaching *anything* that is not backed by example and right conduct.

Can one evil be considered greater than another? It seems pompous to assert to people in the Third World that their struggle for land reform or against oppression is less vital than the largely First World resistance to nuclear weaponry.

The biblical perspective of the sacredness of each life militates against the concept of one death through injustice being less evil than the death of millions. When we assert that resistance to nuclear war is *the* priority, we are simply stating two simple truths. First, the Third World has no meaning unless there is a Third World. Nuclear war cancels their struggle as it cancels them, as it cancels us; it is the one mistake of which we cannot repent and make amends. Second, the Bomb is the ultimate symbol of those perceptions that form the base of the injustice under which the Third World suffers — power, wealth, the state, national interest, security. To reach the point at which the First World is willing to lay down its weapons is to reach the point of spiritual disarmament, the soil from which justice will blossom.

Do you believe that war is a permanent affliction of humankind?

I believe that conflict is a permanent affliction of humankind. But war as a response to conflict need not be permanent and cannot be, or we (and our conflicts) are finished. An old dog can learn new tricks. Or, from the Christian perspective of conversion and the Gospel, a new dog can learn old tricks. ■

We're All Doing Time

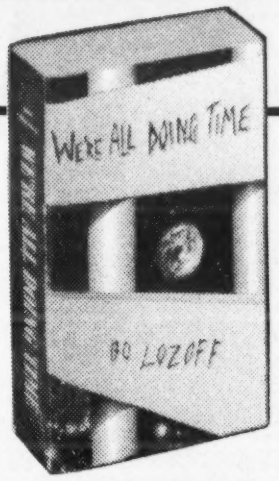
The authors of this noteworthy book became involved in prison work following a friend's drug bust back in the '60s. What started out as moral support for someone they knew gradually expanded into the Prison Ashram Project, assisted financially by proceeds from Ram Dass' book ***Be Here Now****.*

More years and further experiences in prisons produced a series of booklets called ***Inside Out****, how-to manuals on spiritual life in prison, distilled from the wisdom of their own classes, and from prisoners studying alone under the most difficult circumstances. Out of all that a single volume has emerged, the final compilation/lesson plan of everything that worked, from yoga and meditation to Christian and Buddhist disciplines.*

The book can be read on several levels, the most powerful being the personal drama, as prisoners tell their stories in their own words. Watching the progress of someone who's doing time for nine murders stirs us spiritually and lets us appreciate the incredible vitality, desire and flexibility that is in each of us.

But beyond the personal journeys within the intensity of prison life, the book is essentially a primary text on our primary topic — what's life all about, and why am I here, stuck in it? Being on the outside, we are often able to avoid that topic with diversions, but those in prison have 24 hours a day to consider the question. The book's direct methods are geared towards people with immediate, not theoretical, needs.

Free to prisoners, $10 to us on the outside. Any profits go towards more copies for folks behind bars. —Dick Fugett



We're All Doing Time
(A Guide for Getting Free)
Bo Lozoff
1985; 410 pp.
$10 from:
Prison-Ashram Project
Rt. 1, Box 201-N
Durham, NC 27705

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Diet takes on an even more confusing role in prison. On the streets, it's mostly a free-choice situation, and the struggle is usually one of self-discipline to clean up our diets without becoming neurotic about it. But in the joint, the struggle is often the opposite: most cons would *love* to get more wholesome foods — whole grains, fresh vegetables and fruit, "holistic" foods like tofu, yogurt, nuts and so forth, but it's nearly impossible to do.

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I think the first time I discovered true prayer was a few years ago when I found myself lying face down on the floor with absolutely no faith left in all the yoga, all the methods, I had ever learned. It all seemed empty, just a bunch of bullshit. I was lying there and I couldn't even move, because I just didn't have any power left at all. I found myself *begging* God for help; I didn't even realize I was "praying." I wasn't praying like I had always thought prayer was supposed to be — I was flat out on my face, begging God to have mercy on me and help me in some way. And then it dawned on me that I had finally discovered *true* prayer. And that was the answer to my prayer.

Witness to War

A colonel's son and an Air Force Academy honor graduate, Charley Clements was a military version of the All American Kid. Then a tour of duty flying in Viet Nam produced a disastrous event for his service career — he began to think. Soon afterward the Air Force bounced him out, and he took the next step along his personal path by entering medical school.

While doing his residency in a rural California hospital, Clements encountered hideously scarred farmworkers and learned they were immigrant Salvadorans who'd escaped from torture and the death squads. By then Clements had become a Quaker and his conscience was calling more of the shots. That brought him to his next decision in life — go help.

Following a culture warp that boggles the mind, Clements ended up in a rebel-controlled zone in El Salvador, the only trained physician for 10,000 campesinos whose sufferings ranged from malnutrition and malaria to napalm and shrapnel wounds. Although his patients had long ago adjusted to living with lice, fleas, sickness, hunger and imminent death, Dr. Charles had his own initiation to those basics of Third World reality. In addition, there were the frustrations of having been trained in the abundance of high-tech medicine while having to practice with abysmally primitive equipment in a war zone being bombed by the same planes he'd once flown.

I've rarely encountered a mind that made as drastic a change as Clements', nor a book that illuminated an ongoing chapter in our national history so well. If I were to recommend one single volume of all I've read on Central America, this would be it. —Dick Fugett

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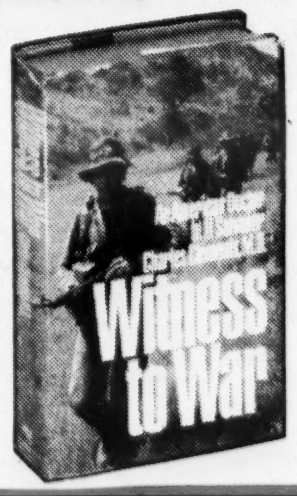
The murder, he said, was conducted by a six-man squad, three veterans and three recruits. He described how the peasant was dragged from his house in the night and then slowly hacked to death with machetes. Each member of the squad had to participate. Each had to cover himself with the victim's blood. This practice, he explained, tied all the members together in guilt and responsibility for the deed. From the moment you first killed with a team, you were bound to them by this common responsibility. Anyone who tried to leave the brotherhood was marked for death himself, lest he give evidence against the others.

Lines of trenches formed part of the defensive perimeter ► and early warning system in the controlled zones.

Battlefield medicine: Dorita cleansing a mortar fragment from a girl's leg.



Witness to War
Charles Clements, M.D.
1984; 268 pp.
$3.95
($5.20 postpaid) from:
Bantam Books, Inc.
666 Fifth Ave.
New York, NY 10103
or Whole Earth Access

Ulli Steltzer

Guatemalan refugees.

PROVIDING ASYLUM

I have had quiet guests living in the dining room of my house since last September — a couple and their cute three-year-old daughter. They are a refugee family from Ethiopia. My church has sponsored them and is actively involved in getting them jobs and settled. The family is here legally (we helped them get Social Security cards and so on) because according to our government these immigrants from Ethiopia are political, not economic refugees. Yet this same governmental voice says that refugees from politically unsteady Central America are economic fugitives. Charging through this silliness is the Sanctuary Movement, largely powered by Christian churches, that is quasi-illegally aiding Central Americans who show up at our southern borders.

I can safely talk about my guests, while Sanctuary workers usually can't. Ruth Ross Soucy, a school teacher in Gila, New Mexico, quietly approached two women friends in Arizona who were in the middle of both the Sanctuary movement and the consequential legal battle biting into it. In this courtroom debate there is more than one bone to wrestle over. The one that I would like to chew on is the role of sanctuaries in a society. There is a clear historical record of the benefits of community asylum threading back to the Six Cities of Refuge in biblical Israel (Numbers 35:6-34). When you made it to one of these cities, you were safe from revenge there. Later on in old Israel all you had to do was grab the horns on the altar to declare asylum. In Christendom, this eventually became the "sanctuary" of a church. As long as you were inside the church compound, no one could attack you. Other cultures such as the Ashantis and the Oman in Africa, and the aborigines of Australia, New Zealand and other South Pacific island peoples evolved places of sanctuary. I don't know about Islam.

There's no book I could find on the subject of how sanctuaries help make societies work. Would somebody write one?

Another question I never got answered was what the wetbacks from Mexico — the ones who are dragged back across the border to slow-death slums in Mexico City — think about this. They are sort of getting passed over by all this nice righteous help. I heard there was a native Mexican Sanctuary Movement that protected Central Americans on the run because getting caught in Mexico was worse than getting nabbed in the U.S. (Mexico doesn't want more unemployed trouble makers). Is this true?

—Kevin Kelly

Two different women in two separate towns in the Southwest were willing to talk to me about their personal experiences in the Sanctuary Movement. One woman did not wish to be identified, to protect the refugees she works with. I will call her Carol.

Susan, the other Sanctuary worker, lives on a quiet street in the foothills of the Tortillita Mountains in Tucson. The homes in her neighborhood are spacious adobes, arranged closely, with high walls and fences between. Lazy, familiar, Sunday middleclass suburban sounds drifted through our conversation. The hum of a lawnmower. A child calling. Rock and roll a few backyards away. A plane overhead.

This is the land of crushed-rock lawns, clock radios, microwaves, tasteful paintings on the white walls, motorboats under the carports. I wondered how all this would seem to me if I were from a small corn culture village in the rain forest of Guatemala, or perhaps from teeming San Salvador.

Susan works fulltime as a legal assistant and teaches Sunday school. In 1980 she worked for an agency that gave immigration counseling to undocumented Mexicans. That's when she first began to see a number of Central Americans coming through. —*R.R.S.*

INTERVIEW BY RUTH ROSS SOUCY

Susan: Our church started seeing a lot of refugees, just by virtue of our location [close to the Mexican border]. There are about a hundred and forty members in our congregation, pretty evenly divided between Black, Indian, Hispanic, and White. Some members can't read or write, some are Ph.Ds, with the whole educational and economic spectrum in between.

Our church, Southside Presbyterian, has a history of never turning anybody away without a sandwich or some gas money, without in some way trying to fulfill their needs. So we did what we could to help the refugees. Some had no place to go, and others needed a place to stay until they could go on.

Usually the government would place a $3,000 to $7,000 bond per refugee. You have to come up with 10 percent cash and the rest in collateral. People were putting up their houses, land, cars. Refugees were applying for political asylum and being turned down. Not only was it expensive, it was frustrating. We began to see the fruitlessness of bonding people out, and the stories of the refugees were becoming more and more desperate.

Since we were housing refugees anyway, we began to consider bringing them into the country as well. There was a lot of talk and thought and study and prayer, and finally the Session and the congregation decided we would do it. That was in March of 1982. We declared Sanctuary and wrote to the U.S. Attorney General, as well as to the local INS folks. We advised them of what we were going to do, gave them the dates and times, held a press conference.

Word spread very quickly. Various people around town would learn of refugees coming, or people would just appear. People would arrive with scraps of paper with numbers and contacts scribbled on them.

At first, we were seeing a lot more refugees than we see now. I think it was because there were more people coming then, and now we have more precounseling in Mexico to determine how much risk the refugees are in. Because resources are limited, we had to figure out a way of prioritizing, which is a terrible thing to do with somebody's life.

Carol: Sanctuary groups find they must discuss who they want to help, and one of the debates is, "Shall we help people who aren't willing to speak out on the conditions in Central America?" It is felt that as the American public becomes more aware of the situation, the sooner military aid can be stopped, the sooner the war can be stopped, the sooner there won't be any need for people to come here in the first place. A group must look at itself and ask, "Where are we going to put our energy?" Should they help a guy who maybe drinks and can't get himself together, or should they concentrate on somebody who can explain things so the public will become indignant about what our government is doing?

But refugees are fleeing something that happened to them in their own lives. They don't necessarily know what's happening in the rest of their country, the rest of Central America. Some Americans picture a refugee as someone who stands up in front of a church, at very great risk, with a bandanna over his or her face, and gives an excruciating personal account of what happened to him. We're disappointed when refugees won't speak out, and yet asking somebody to pour out in public the most incredibly painful experiences — some of them are unimaginably painful — isn't reasonable, either. Not many refugees are up to the task.

Another debate among Sanctuary groups is, "Shall we just help those who are fleeing terrorism, or shall we also help those who come here because of poverty?" That's a tragic debate, a tragic discussion to have to have. It divides groups sometimes because there's supposedly a legal basis for helping someone fleeing danger, and there is no legal basis for helping someone who is here for economic reasons.

To me, they're just different forms of violence. Torture and killing are faster, but working hard all day long and still not making enough to maintain basic health, watching your children die of malnutrition before they're five years old, is another kind of violence. It's a tragic situation to have to choose to help only people

Ulli Steltzer

Guatemalan refugees make a new life in Los Angeles.

who have spoken out politically, put themselves in personal danger, as opposed to others who have fled because they're poor and dying and there's violence going on all around them.

Susan: I don't believe that every single person who is deported back to El Salvador is shot or tortured. On the other hand, being killed by a bullet isn't the only form of death. It's a very fine line between economic and political refugees. If, as our government says, people are coming here following the American consumer dream, they are quickly disabused of that idea.

I want to tell you the story of Roberto, a 12-year-old boy who walked from Guatemala to Tucson and showed up at our church. He'd lived in a village that had been accused of being sympathetic to the guerrillas. The soldiers came in his house, killed every family member. His mother and dad, six brothers and sisters. They shot him. He managed to fall behind a box or something. He remembers most vividly one of the soldiers throwing his 18-month-old sister into the air and catching her on his bayonet. Some villagers later found him and took him to a refugee camp where there was a doctor. They tended him as best they could, but they said he would never walk again because the bullet had been near his spine.

He not only walked, he walked from the border of Chiapas all the way here. Such a sad little fellow, but so streetwise. When he got here, other refugees saw him and said, "Oh, we remember him. He was living like a dog. He ate from the gutters."

I asked him why he had come here, and he said, "I heard there weren't any bombs in the United States." He had heard they didn't kill people here. He didn't know about a refrigerator, he'd never seen a TV.

You multiply that by hundreds, by thousands. I spent one summer interviewing refugees in detention centers. I've talked with almost all of the 2,000 refugees who have come through our church. Forty-five or fifty people have stayed here at my house — and there's not one of them who doesn't have a story similar to that.

Carol: We want to hear good news. We don't want to hear about these things. We have a hard time when refugees tell us these things. We're trying to enjoy something and we don't want to listen to them. We don't have any experience we can compare it to.

Susan: You don't become involved in this by talking to eight people,

reading four books, and then going out to do your assignment. A friend of mine is a policeman, and while I don't think he would drive down to the border and bring somebody up here, he has been very kind to the people who have stayed with me. One of the first things I do when little kids come is to take them over to visit him when he's in his uniform. Refugees have a tremendous fear of people in uniforms. They can see his own little kids hanging onto him, see him holding them. They can get in his patrol car and he'll turn on the lights, the siren.

Carol: It's impossible to get the confidence of a refugee without taking some little risks yourself. Even though the risks we run are a lot less, they respect us for what we do risk, and a kind of solidarity grows up between refugees and Sanctuary workers.

Once I met a nun who was transporting refugees in the border area where it's the most dangerous. She expected to get caught sometime. She said that if she was caught, she didn't want the Movement to spend any money on her defense, that it was better to spend all our resources on helping the refugees. And it wouldn't hurt her to be in jail for a while. My feeling is, we take little chances now, of going to jail or whatever, to try to avoid a catastrophe to the human race.

Susan: Now, suddenly, Sanctuary is a big deal. But it's the government that's making it a big deal. We now have a media office and all that, really far away from the needs of the refugees. I'm on the Sanctuary Defense Fund board, yet I think that kind of organization is very frustrating. Megabucks are being raised for the defense of 11 Anglo and 2 Mexican defendants charged with aiding the refugees. But what about the refugees themselves? I had to consider what I would do if I got arrested, but it never occurred to me that somebody would pay my legal fees or bail me out. Getting arrested is just a risk.

Our government is promoting the myth that Central American refugees come here and want to stay forever. It's hard to generalize about what happens to people when they come here, because there are so many different situations. One thing that is true is that the majority of the people work for minimum wage or less, if they find jobs at all. They wind up living in a small apartment with lots of people. One family I know is now in Los Angeles in a two-bedroom apartment with 29 people. They are profoundly sad and distressed about being here. The men are particularly ambivalent. They feel they should be back in their country fighting the fight, being with the brothers and sisters there. They are torn between that and trying to keep their wives and children safe. Some go to English classes and try to learn English quickly. Others absolutely, stubbornly refuse to ever learn one word of English because they see that as detracting from their commitment to their country. They don't want to be Americanized.

Carol: As long as they're far from their countries and they can't go back, they're unhappy. So Sanctuary work is very unsatisfying in a lot of respects. Things that you think are successes, like learning English, getting a job — they feel are taking them farther and farther from going back home.

When you need help, when you need protection, you can go to a church. It's not the walls of a church, it's the spiritual love and protection that people have for one another that provides the safety. When the Bible says that Jesus "calmed the waters," what does it mean? There was a storm raging. But was it the storm He calmed, or was it the hearts of the people who were afraid of the storm?

These people have lost family members, friends, their dignity through terror, imprisonment and torture. They have left behind their community, the social fabric of which they were a part, their identity, their language, their food, their songs. They've lost things they've worked for all their lives, skills that don't apply here. When they get here, they have a kind of strength that many of us didn't know existed. That's unsettling to us. It's a strength that makes the church an appropriate place for them to be. They are delivering a spiritual message that we didn't discover without them.

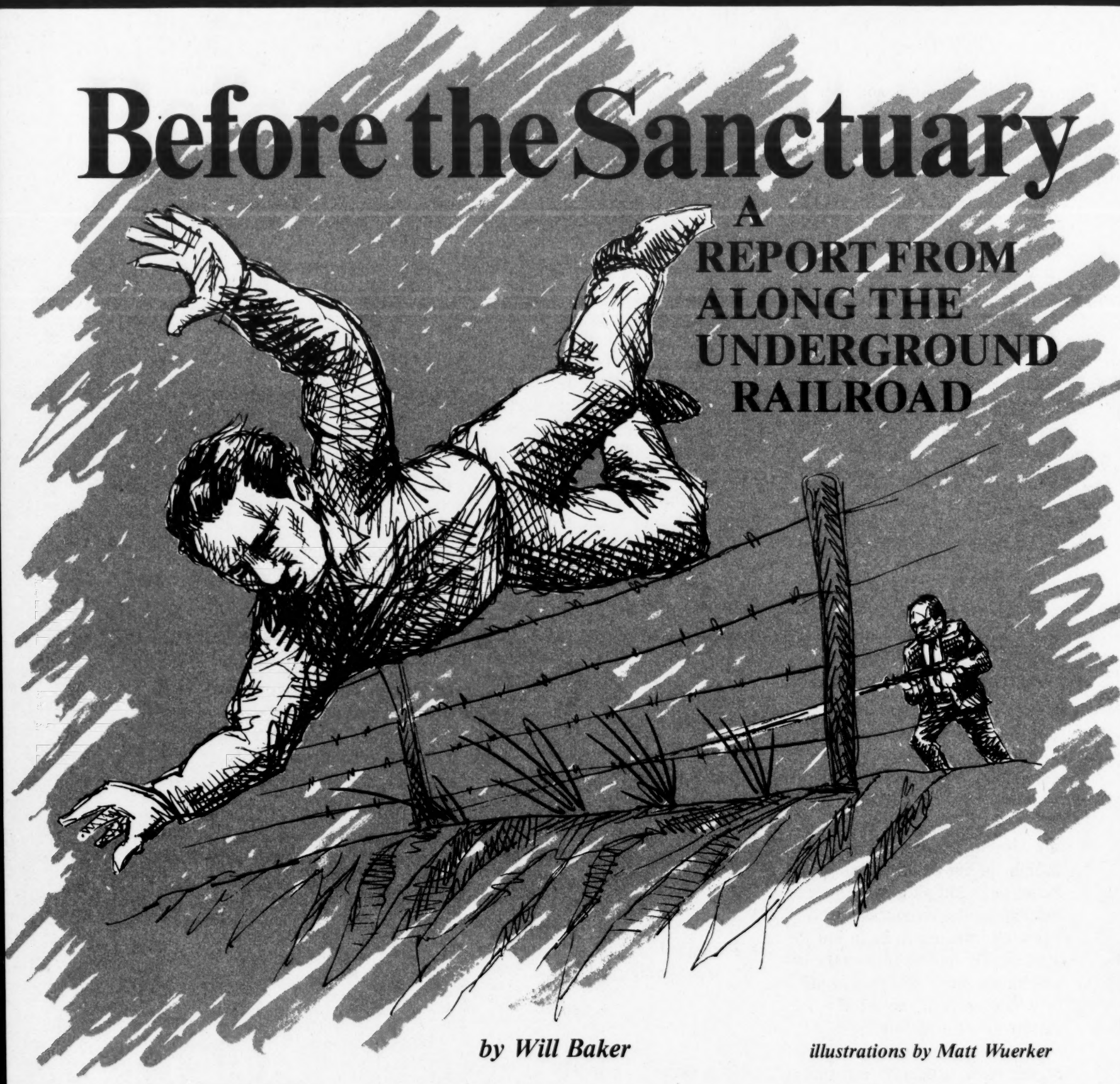
They give us a powerful source of hope, in a world filled with cruelty, greed, racism, and oppression — a hope that there's a real, good, strong, spiritual part of human nature that's going to prevail. ■

Matt Wuerker

In a Guatamalan village, a white plastic bag is hung on a pole to indicate neutrality.

Before the Sanctuary

A REPORT FROM ALONG THE UNDERGROUND RAILROAD



by Will Baker ***illustrations by Matt Wuerker***

Continuing his career of unveiling things more complicated than they first appear (see his two penetrating accounts of Nicaragua in WER *#45, p. 57 and #46, p. 4), author Will Baker aptly makes chaotic, confusing, and dubious what had been the simple misery of a refugee seeking peace.*

The sketches come from Matt Wuerker (he did the urban legend lady-with-microwave-poodle cover for WER *#48), who, with his wife Sarah Stephens, works with Guatemalan refugees in Los Angeles. The photos in the previous article were also supplied by them, courtesy of El Rescate (Rescue), a group sponsored by the Southern California Ecumenical Council to assist Central American refugees.* —*Kevin Kelly*

I HEARD ABOUT SANCTUARY a couple of years ago. They were looking for people who could put up refugees from Central America or provide them with employment. I thought that might be a good deal for me. I have a small acreage chronically in need of attention, a small crop to bring in, and a regular job at the public trough that interferes with such work. I also have a habitable barn: concrete floor, stove, refrigerator and bed. And I speak Spanish. A refugee could make use of the space, and I could supply enough odd jobs to keep him in groceries.

I also believed my government's misguided policies in the southern hemisphere were partly responsible for driving people north, and felt some obligation to compensate the refugees. And finally, I was curious to find out what was really going on down there from people who ought to know. So I contacted Sanctuary, and they sent representatives to check me out.

The couple who made the visit were very likeable, open-hearted, and savvy. They told me their own involvement was through a

local confederation of churches, and no one had any experience in this sort of thing; no one knew how long it would take to find the right individual or couple (about the limit of my barn), where they would come from, or how illegal and risky the whole operation might be. To be safe, we were going to talk only in person or from pay phones. They explained that anything we set up would be on a trial basis, no final commitments, no hard feelings if things didn't go right.

For two months nothing happened, and I stopped giving much thought to the whole matter. Then I got a hurried call. A young man was already on his way from Texas. Would I still be willing to offer a haven? Good, hard-working kid, twenty-four, peasant background, no English, definite victim of political oppression. Maybe a trial period of a few weeks?

It sounds like a pretty good bet, I said, if this young man can take the isolation and doesn't mind odd jobs to start his career in a democracy. The opinion at the other end of the line was that we would be just right for each other. I thought it over for maybe five seconds and said, sure, let's do it.

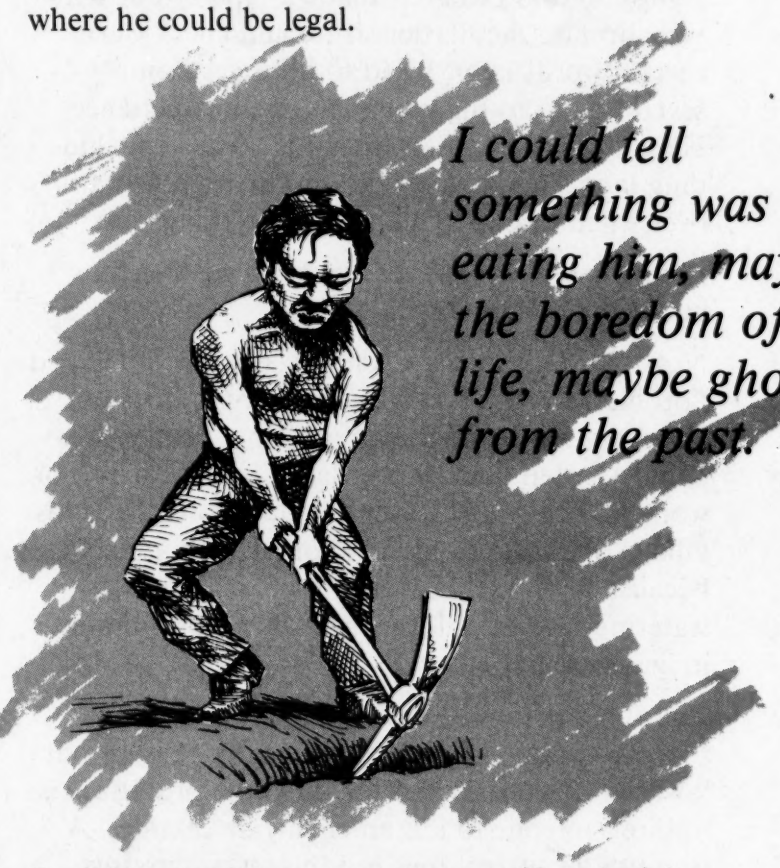
So Antonio arrived the next afternoon, all he owned in one flight bag. He was pretty well disguised — fresh teeshirt and Adidas — except for a high, glistening pompadour and an unnatural smile frozen on his Indian features. He had very large, very quick eyes, and a remarkably well-muscled small frame. When he moved he reminded me of the toreadors in the only *corrida* I'd ever seen: a gait at once mincing and menacing.

In the next couple of months I found out he was indeed a good worker, alert and quick to catch on (mastering my little Ford tractor, for example, in one two-hour session). He was also tidy about everything except cans and bottles, which he threw aside or out the window with a medieval insouciance, and he was very polite, and very silent.

We ate together pretty often, talked mostly about the fences or water lines or trees, worked a little on his English, but he wasn't volunteering much. I picked up that he had been in the army, had run into certain family problems, and had walked over the border without the slightest difficulty. He went to see *El Norte* and laughed out loud at the heroic struggle portrayed there. Not like that at all, he said. The border is the easiest part; it's what lies on either side that's tough.

Now and then we went to town and he met with church groups where there were other refugees from other communities. After one of these trips I got worried calls from people in the movement. Some of those other refugees feared that Antonio might be an informer. It seems he had remarked to someone that he liked President Reagan. An hombre who knew his own mind, he said. Not many conversations later, he told someone else he was thinking of going to Nicaragua to join the Sandinistas. At the next church session he was indirectly grilled on some details of his story, and it appeared that not only had he been in the army, he had worked in the division in charge of internal security. What we call "intelligence."

There was something of a flap, and I deliberately stood well to the side of it. Antonio was forking hay and laying pipe like a good boy, so I had no complaint. Twice I left for stretches of nearly a week, leaving him in charge of cultivating, fertilizing, and watering plants and animals, and he never missed a base. But I could tell something was eating him, maybe the boredom of rural life, maybe the strangeness of California, maybe ghosts from the past. He announced one day he thought he had better move on soon to Canada, where he could be legal.



I could tell something was eating him, maybe the boredom of rural life, maybe ghosts from the past.

I might never have gotten the story if we hadn't had our confrontation. No need to go into details. The problem involved what I viewed as petty pilfering, quite negligible by itself, but followed by a lie to cover it up. That I considered a serious matter, and I told him so. He retreated into an impermeable shell of silence for ten days. Not a word, not a lick of work. He stayed in the barn and I never even saw him, only heard occasional tapes of latin rock playing on the blaster I had loaned him. I knew he was running short of food and briefly considered starving him out, but finally knocked on the door and told him we would have to do some talking, man to man. Otherwise he was indeed going to be on his way, to Canada or hell didn't matter to me. I said I didn't care about being nicked for something so trivial, didn't give a shit what he thought of Reagan, didn't care what he had done in the army,

but there was a principle involved here that went beyond boss and employee or refugee and sanctuary. The principle was trust between friends. Friends didn't lie to each other. Friends was what I considered us to be and if I was wrong I wanted to know about it, right now.

My voice was not that steady, and for the first time in two weeks he looked me straight in the eye. Yes, he said, he had lied. Yet in his country it would have been an acceptable lie. There were things about Guatemala I did not understand. Things about him too. I said maybe we'd better get to that then, so we went back to the house and sat down at the dining room table and opened a bottle, to get our voices steady.

Over the next few days the story was pretty much filled in, except for uncomfortable places that required slow going. My Spanish is fair but not slangy, and to be sure I made a tape of our conversation on the blaster so I could check out certain words later. I had to hit on Antonio several times to dig down to certain experiences. He got reticent at first, then his voice kept skidding into a nervous giggle, and he trembled all over when he finally blurted some things out.

Edited down severely, here is what he told me about life in Guatemala.

Nearly three years ago Antonio's father developed "problems" with a neighbor. Antonio does not know the nature of these problems. People in his country often quarrel over land, water, money, or women. The quarrels can be murderous. Near his village one peasant killed another with a machete because he thought his neighbor was drawing water beyond his allotment from their common irrigation ditch.

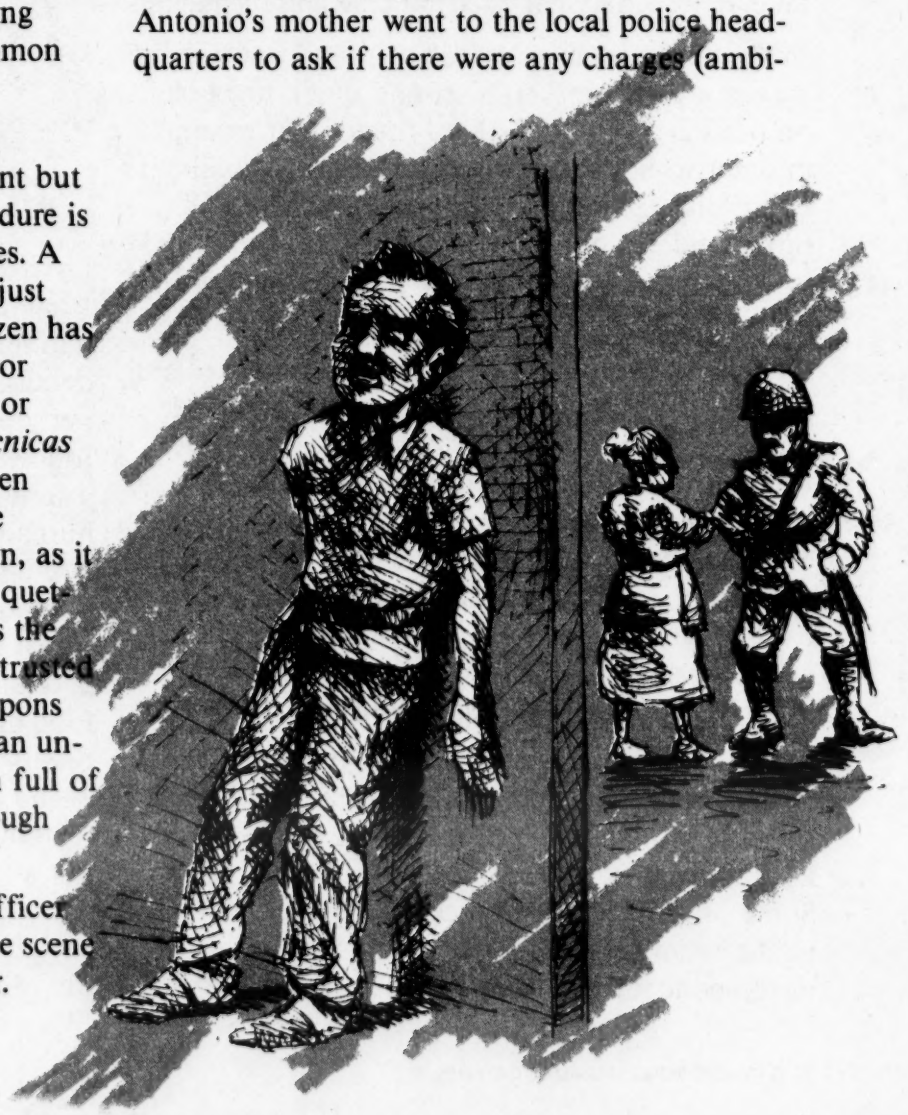
But only the lowest classes settle their own scores. Antonio's family is not really peasant but lower middle class, and for them the procedure is to hire someone to kill an enemy or enemies. A respectable citizen does not, however, hire just anyone to do his killing. A respectable citizen has influence with one of the several divisions or subdivisions of police, usually the *judicial* or DIT (*Departamento de Investigaciones Tecnicas de la Policia Nacional*). A respectable citizen need then only pass on to an officer of the *judicial* the name of the undesirable written, as it were, on a bill of large denomination. 300 quetzales (about a hundred and fifty dollars) is the going rate. The officer and a group of his trusted men go home after work, taking their weapons with them. They change clothes, pile into an unmarked car, find the victim and shoot him full of holes, along with anybody else unwise enough to object.

The next morning, quite commonly, the officer and his men, now in uniform, return to the scene of the shooting to "investigate" the matter.

Nobody who might have noticed this remarkable coincidence is likely to mention it, for people are encouraged to demonstrate their cooperation with the authorities by overlooking it. Another mark of good citizenship.

In passing, it might be mentioned that this system exists for lesser crimes as well. Antonio says that there is a rather lively trade in marijuana. If the narcotics squad makes a bust, after handcuffing their prey, they routinely roll and light a few numbers. If the stuff is good quality, they take all but a token bag and merchandise the bulk of it after work, as independent entrepreneurs. Also, the lowest rank of police are paid so poorly that, off duty, they commonly execute stickups in precincts far from their own beat. The gun and what it can earn are considered minimal perks for the guy on the beat.

Four men appeared at Antonio's parents' home one morning and asked to see him. He heard them from his position flattened against the dining room wall. Amazingly, they believed his mother's statement that he was not in, took a routine gander around, and retired to their vehicle outside to wait. Antonio dropped out a back window and left for a cousin's in Guatemala City. He heard through the family grapevine that the *judiciales* were looking for him — unofficially, of course — because his father's neighbor had paid very well for a hit. It was necessary to start with Antonio because he was the eldest son — young, tough, and capable of vengeance. If they got him, the notion was his old man would not have the heart for further retribution. When Antonio's mother went to the local police headquarters to ask if there were any charges (ambi-



guous word, for one option open to people is to pay the authorities *more* than they are getting for the assassination, a form of security insurance), she was told there were no charges. Her son need only present himself at the station to discover as much. The family was not, of course, so foolish as to pass along such advice.

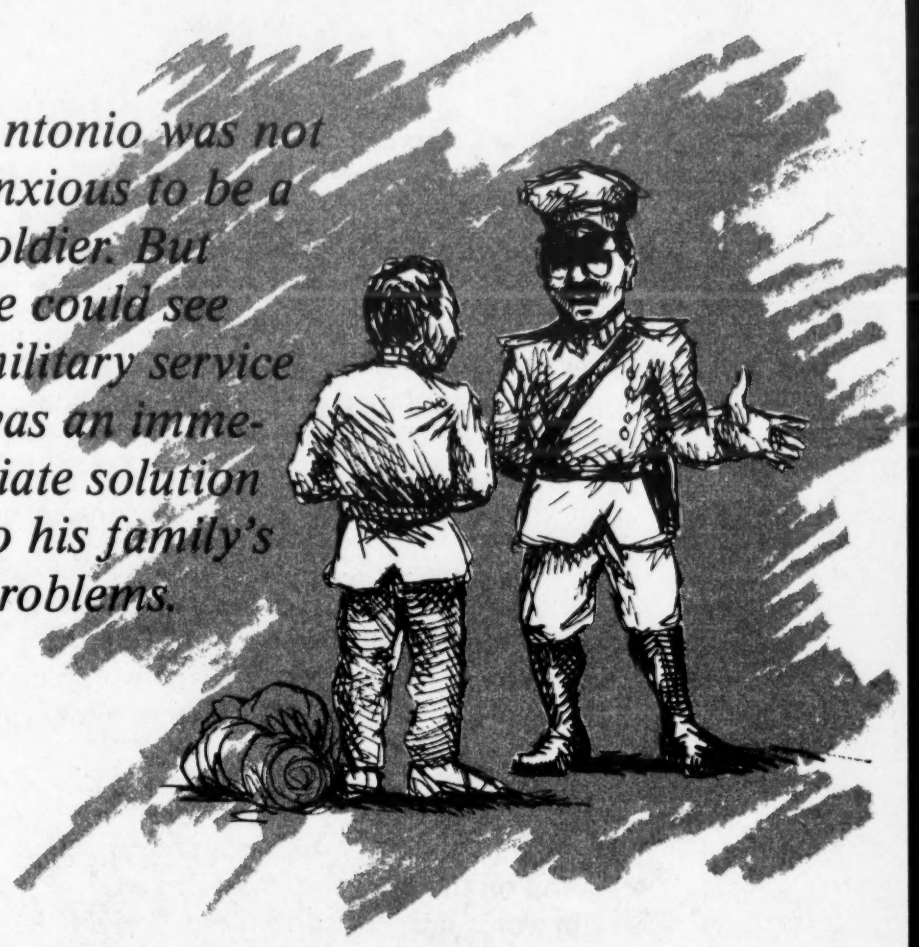
There matters might have stood, Antonio an eternal fugitive, except for an agency that acts as a counterweight to the extortionist police. That agency is the army. Besides its combat troops devoted to searching and destroying the insurgent, commie-backed campesinos and Indians, the army has a large and pervasive network of domestic surveillance and special cadres for dealing out swift, covert punishment. These cadres also operate in plainclothes, from unmarked cars, after working hours, and travel heavily armed. Frequently they clash with the gangs of off-duty *judiciales,* and they generally prevail, for they have better equipment and information.

During his exile, Antonio happened to make the acquaintance of a well-connected army officer from Zone 4 in Guatemala City, the capitol. The officer listened to his troubles and instantly recommended that he join the army. Without any official police record against him, he would be inducted, given a uniform and a gun, and be assigned to a unit where he would thereafter have certain security as a soldier fighting for his country. Whoever dares kill a soldier immediately becomes a subversive, an important classification, for the nation's best developed, most ruthless apparatus of extermination is unleashed on such criminals. In uniform, therefore, Antonio could return to his village with relative impunity.

Antonio was not anxious to be a soldier. He had some idea of what was going on in the jungle. But he could see military service was an immediate solution to his family's problems, and it was only for a couple of years. With the officer's help, he enlisted, and after basic became a military policeman in Zone 1, an agricultural region (Quiche) where the guerrillas were active.

He went on numerous patrols and came under fire, but nothing very dangerous. Antonio held the guerrillas to be contemptible adversaries. They were foolish, often armed with no more than shotguns and small-caliber rifles, some in the hands of mere children. Even when they had equipment and help from infiltrators — Antonio mentioned Nicaraguans, Salvadorans, Cubans, Belizans, and whites speaking strange languages — they made mistakes and were annihilated more often than not. Antonio did not like the guerrillas because he said they stirred up the Indians, misled them, and ultimately got them killed. Also he simply did not understand their cause.

Once, he said, they ran down a guerrilla out of ammunition. The patrol leader came over to kick



Antonio was not anxious to be a soldier. But he could see military service was an immediate solution to his family's problems.

the prisoner around a little and asked him why he was betraying his own country. He asked him why, why, why, over and over, and the man said nothing until the officer got close enough and then the guerrilla spat in his face. The officer told his squad to *quita-le los huevos* (take his eggs) so they cut off his balls, but still the man would say nothing. Absolutely nothing. So they gave up in disgust and shot him. Antonio said he could never figure it out, what the guerrillas really wanted.

After ten months in the field, where he distinguished himself for being cool and alert in combat, Antonio was invited to enroll in a special two-month course. If he passed, he would enter the intelligence cadre, the G-2 or SIM (*Servicio de Inteligencia Militar*) unit, where the pay was much higher. In fact, seven times what he was getting as a grunt. He accepted, did well in the course, and entered G-2 as a sergeant.

His life changed dramatically. Antonio admits his primary motive was simply to get ahead, have a little money to send home or to squander on beer and girls, but it was also true that the regular army service was very boring and debilitating. Guatemalan recruits, he said, get a helmet, two uniforms, a weapon, a field pack and nothing else. They must buy their own soap, paper, towels, silverware and some additional food. They get 50 quetzales a month, barely enough to cover even these minor essentials. Many of them, like their superiors, smuggle weapons home between manoeuvers (they are able to go home at night or on weekends) so they can form small gangs and do robberies to supplement their salaries. Most people join the army in the first place, Antonio noted, because they are starving.

In his new job, Antonio practiced spying and in-

formation gathering as an agent in the field. The system works like this: a tip is passed that a certain individual may be a "subversive." An agent is dispatched to hang around the neighborhood, watch and listen. After a day or two another agent takes over. They are rotated often so faces do not become familiar. Some are actually informants from the neighborhood where the suspect resides. Each observer files a report: who came to the suspect's house, who spoke to him, what he said in a certain meeting or conversation.

Then the reports are reviewed in a central office and one of two things happens. They are refiled, case inconclusive, or they are stamped for corrective action. If stamped, they are forwarded to an office which prepares an indictment for crimes

Quite often, the suspect resists arrest and in the ensuing struggle is fatally injured.

against the state. An investigative team is then dispatched — armed men, plainclothes, unmarked car — to serve the indictment. Quite often, as they are performing their duty, the suspect resists arrest or attempts to escape and in the ensuing struggle is fatally injured. Even more often, before the team can act officially, unidentified persons — armed men, plainclothes, etc. — shoot the object of investigation. Either way, file closed.

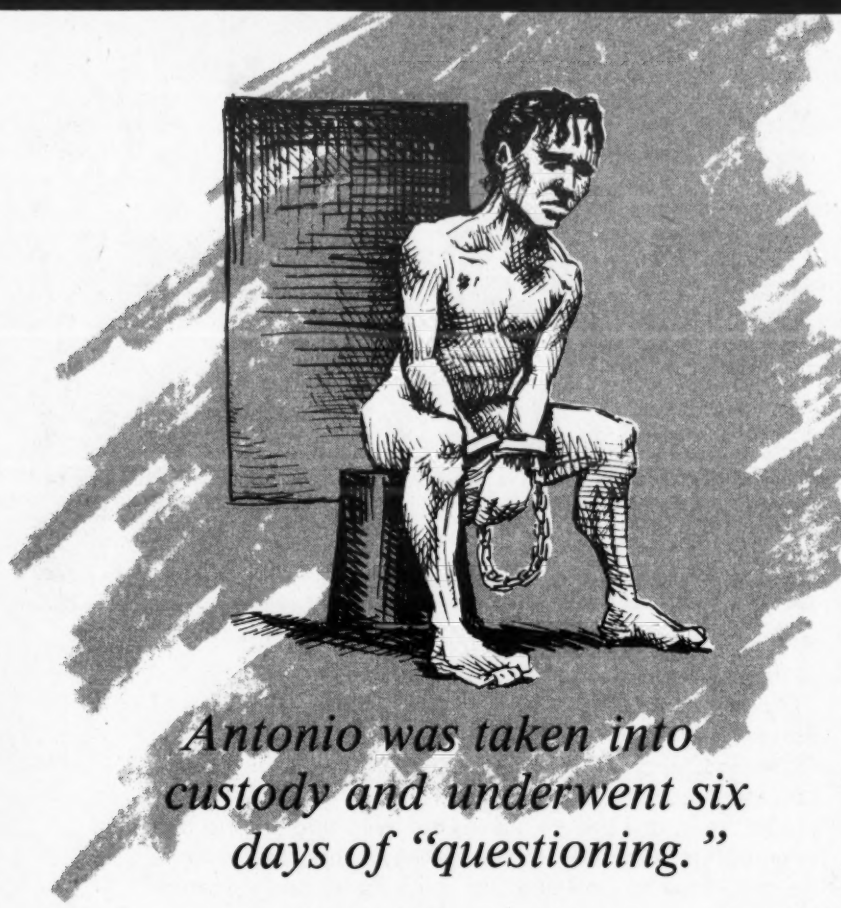
Passing in and out of various offices, Antonio had a kind of random access to this information. In addition, his native intelligence and quiet, no-nonsense way probably impressed his superiors there, just as in the combat forces. He was given extra leave time for good conduct and was often entrusted with the transport of a complete file or asked to pull one for review. Now and then he ran across a situation near his own district — it's not that big a country — so he had information from outside as well as inside the G-2 corps.

There was the example of the priest in a certain village, whose inhabitants had always depended on water from a little creek. A large landowner upstream from the village began to divert most of the water to irrigate new fields, and the priest openly criticized this diversion. The landowner had good relations with the authorities and brought to their attention the troublesome talk of the priest. G-2 was alerted. The agents went out and came back with reports that the priest was now attacking directly from the pulpit. He was even claiming that there was a connection between the very great wealth of the landowners of the whole region and the extreme poverty of their laborers. The review was prompt, the stamp clear. The priest was mown down with automatic weapons. The papers reported that the authorities were — of course — conducting a vigorous investigation of these tragic events.

Antonio also began to notice other things. There seemed to be no old men in the army intelligence division. No one around him, in fact, had been working there for more than seven years. The lifestyle of the higher ranks of officers appeared to be very fast. Disco and good dope, new cars and lots of girls. He began to wonder if anyone ever left the intelligence service, and if so how. There was vague talk of transfers, setting up in civilian life, but he also heard some disturbing rumors about what might be involved in "retirement" from this top-secret branch of the service. It was even suggested to him that when life was very sweet, one shouldn't expect too much of it.

Antonio had not proceeded very far in such speculation before he encountered a more serious and personal difficulty. He met another young man, also in the army, who introduced him to a young lady. Members of the fast set. It wasn't clear to him, Antonio says, that she was this guy's girl. When she seemed to flirt, he flirted back. One thing led to another — Antonio is very good-looking — and the new "friend" was very bitter. He warned Antonio he would get him sooner or later, and the opportunity came soon enough, in a very unexpected way.

The former friend, like so many of the aspiring youth in the military, had organized a gang and was commiting petty holdups. He made a bad mistake by entering the house of a man who worked as an informant for army intelligence. Once there he made a worse mistake by allowing his men to gang-rape the man's wife and daughter. Then he made a final and fatal mistake by not killing all three of them. The man took his grievances to the highest authorities, as they say, and the guilty parties were picked up in a matter



Antonio was taken into custody and underwent six days of "questioning."

of hours. The ex-friend knew he was already dead, but he saw his chance to nail his enemies on the way down. Besides the other four members of his gang he named Antonio and two others as collaborators, figuring the investigators would believe the testimony of a doomed man.

Antonio was taken into custody and underwent six days of "questioning." Stripped, handcuffed, beaten, interrogated for hours on end, finally subjected to the generator and wires applied to sensitive regions of the body, Antonio kept maintaining his innocence. The five real members of the gang confessed after the first couple of days, but were held as "witnesses." On the sixth day the investigators gave up, shot the five they were sure of, and sent Antonio and the others to jail to await trial.

He spent a year and a month in jail, doing exercises that made him into a miniature version of Charles Atlas, appearing every few weeks at some preliminary hearing where he would relate the same story of love, jealousy and revenge. His alibi was consistent and the record showed no prior infractions. On the other hand he had been G-2, well-paid, and to be implicated in such a sordid and brutal crime was a serious matter.

Then he was abruptly released. Handed his discharge as well. No trial, no conviction, just dismissal. Antonio returned home, hoping to be able to get back into civilian life and forget the whole business. But he also knew he had worked at intelligence headquarters with sensitive material, knew a lot of agents, a lot of names, and there were no old veterans of G-2. For two months he tried looking for jobs, walking carefully in the streets, fighting an acid stomach.

Then one day, rounding the corner for home, he saw a car and some men in neutral suits at each end of the block. They saw him too and then he was running — resisting arrest — and when he reached a barbed-wire fence he got one look back and saw a man with a submachine gun pulling down on him. He dived over the fence, hit and rolled, the bullets skipping in the dirt all around him, made it to a ditch and finally into the brush at the base of a slope.

He determined then, he says, to leave Guatemala. And he just kept going. He has since moved on to Washington, only a step away from Canada, though he talked vaguely of Spain, too. Somewhere, anyway, where he could be free to walk around without fear, no knots in the stomach. He could maybe join an army — that is why he once thought of the Sandinistas — because he has experience and skill at that job; but it would have to be an honest army.

The last time I talked to him he said he missed his country, felt a little guilty about abandoning it. On the other hand — did I see? — no one trusts anyone there. The police are the criminals, and vice versa. The guerrillas are stupid. And the ordinary people just don't care or are too afraid to do anything. The army has all the power, the guns. And he couldn't go back to *that* army. Someday maybe people would get together and throw out the ones who will do anything for money, who regularly kill for it, but he didn't see it happening soon. Money and guns — insurance from the U.S. — gave the government a lot of power. In a way, when he thought about it, he wasn't betraying his country. It had betrayed him. Did I see? A small theft, a little lie — these were nothing, a matter of survival. But the big ripoffs, the big lies — they caused all the others and were a vital matter; they could cost you your life. Did I see?

I'm beginning to. ■

The last time I saw him he said he missed his country, felt a little guilty about abandoning it. On the other hand — did I see? — no one trusts anyone there.

Sanctuary: The New Underground Railroad • This Ground Is Holy • Sanctuary

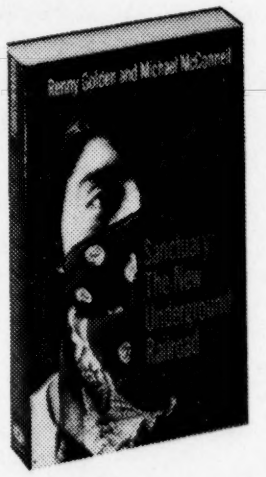
I read these all with equal satisfaction. The most muscular was ***Sanctuary: The New Underground Railroad****. It tied knots in my gut with firsthand accounts of the violent confusion refugees are running from in their homelands and the silent confusion they are running into here. There's accurate documentation of the process of underground railroading and a hint about the extent of a clandestine Sanctuary Movement in Mexico.*

On a more lofty level is ***This Ground is Holy****. The compelling moral and religious arguments are paraded at length, commencing with the history of sanctuary in law and finishing with a standoff between church and state (keeping the two separate actually gives the church greater leverage). It makes clear that the current Sanctuary Movement is not a radical aberration of U.S. policy but at the center of a broad avenue of the moral thought that founded this country.*

Sanctuary *is a collection of essays and speeches presented at a two-day symposium on the subject. Its view is broad: the worldwide implications of Central American refugees, human rights ethics, reflections by other kinds of refugees, and a brief appendix on who to contact to participate.*

Because of the uncertain legal status of this help, anyone inclined to casually open their doors for sanctuary should read these thin primers first: ***Sanctuary and the Law: A Guide for Congregations*** *and* ***Public Sanctuary Organizer's Nuts and Bolts*** *($3.00 each from Chicago Religious Task Force on Central America, 407 S. Dearborn Street, Room 370, Chicago, IL 60605).* —*Kevin Kelly*

Sanctuary: The New Underground Railroad
Renny Golden and Michael McConnell
1986; 214 pp.
$7.95
($9.45 postpaid) from:
Orbis Books
Maryknoll, NY 10545
or Whole Earth Access



This Ground Is Holy
Ignatius Bau
1985; 288 pp.
$9.95
($10.95 postpaid) from:
Paulist Press
997 Macarthur Blvd.
Mahwah, NJ 07430
or Whole Earth Access

Sanctuary
Gary MacEoin, Editor
1985; 217 pp.
$7.95
($9.45 postpaid) from:
Harper and Row
Keystone Industrial Park
Scranton, PA 18512
or Whole Earth Access

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Witness: Alicia ▲
"My 16-year-old sister, 17-year-old brother, and I left El Salvador in December 1980. I was a catechist with the Catholic Church in the capital, involved with the base communities. What we did was to learn the Bible according to the time we were living, trying to understand the exploitation and injustice and poverty and misery. And we would go around and teach the Bible, and we would try to raise the consciousness of the people: why the exploitation, why the injustice, why there were no schools for their children. . . .

"We started to hear rumors that the security forces were wanting to come into the church, kidnap the padre, and kill him. We immediately became afraid of meeting. One day, he was celebrating Mass and they shot him. A little while later one of my co-workers was kidnapped where we worked. . . . When he finally showed up, we hardly recognized him."
—*Sanctuary: The New Underground Railroad*

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The courts have not yet determined whether a legal privilege of sanctuary exists under United States law. The recent prosecutions of sanctuary workers in Texas and Arizona have focused on the unlawful transporting rather than the unlawful sheltering of undocumented aliens. Both crimes are defined in the same federal statute and this analysis will consider them together, with emphasis on the harboring provisions which are the most directly relevant to any legal liability for the provision of sanctuary. —*This Ground Is Holy*

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In King Alfred's grant, sanctuary lasting for three days is available to anyone accused of any crime. There are severe penalties for violating the sanctuary and injuring the fugitive in any way during the time of protection. Alfred's law also indicates that one purpose of the sanctuary was to facilitate composition settlements between feuding parties. Presumably, the protection of the sanctuary allowed more rational negotiation.
—*This Ground Is Holy*

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The right to asylum is the partner of the right to leave a country. The right to leave ensures that people who need to flee a country can get out; the right to asylum ensures that they will have a place to go. —*Sanctuary*

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Human rights — including the right to asylum — do not depend for their existence on their acceptance of governments; they exist independently as standards of argument and criticism. Some fundamental claims can be based simply on being a person with feelings, intelligence, choice, and a point of view of one's own. Since these claims are based on being a person rather than on being a member of some group, they can — when sufficiently serious — generate duties to assist that fall on countries other than the claimant's native land. These duties are not neutralized by national boundaries. —*Sanctuary*

In the Land of Israel

Israeli novelist Amos Oz is a kibbutznik, a veteran of the '67 and '73 Wars, and an outspoken member of Israel's "Peace Now" movement. In the Fall of 1982, following Israel's invasion of Lebanon, he made it his business to go around to his neighbors "in the Land of Israel" — people he often disagreed with, some of whom hated his guts — to get their vision of Israel's destiny.

We step into the world of settlers of the territories of Judea and Samaria (the West Bank), who see themselves as defenders of the original vision of the historic Land of Israel restored — which has recently become unfashionable. We have a late night bull session with Jewish laborers from North Africa, who see in Begin's leadership the vindication of their experience as second-class citizens. We glimpse the world of the ultra-orthodox Jews of Jerusalem who see in Zionism — religious Zionism especially — an affront to the redemption that is to come by the Hand of God. We run into a character who is enthusiastically "willing to do the dirty work for the People of Israel, to kill as many Arabs as it takes . . . " to make Israel secure even for "tender" and "delicate" types like Oz to go and do their humanitarian thing. We sit quietly with a Catholic priest who sees in Israel's moral struggles the trials of a nation singled out to be a light unto the world. It is interesting that his view of Israel's "specialness," no less than the rest, makes Oz uncomfortable.

As I read I found I would empathize, in turn, with each contradictory position. I found a truth, as well as a blind spot, expressed in each one. There are no simple solutions. Oz leaves his characters (including himself) to their own rationalizations, and left me feeling for the Heart of the World which somehow must contain them all.

—Ya'qub ibn Yusuf

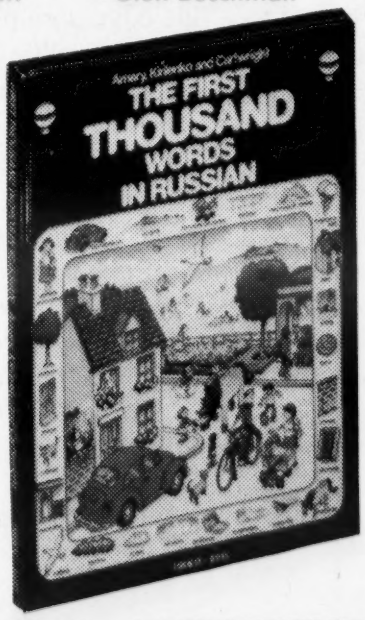
•

Zvi attended the grammar school in Bat Shlomo in the days of the Ottoman Turks, dressed in a little tarboosh and home-sewn pants made of canvas bought "under the table" from a Turkish soldier. Poverty was widespread. "Not poverty like in the slums of Jerusalem, with a Frigidaire and a TV, but real poverty: the farmers worked the soil with their sweat to grow wheat and barley, sorghum and beans, and they only ate what they could grow. There was no other food. . . . All told, there were about fifteen families here in those days, maybe not quite so many. And all around was empty! Desolate! Jackals and Bedouins! The wind would howl in winter like a hungry devil! In the school we children sat on the ground. They taught us Bible; they taught us Hebrew, arithmetic, and a little French. Arabic we learned outside in the fields. And in the year nineteen and fifteen the Lord had mercy on us and sent a plague of locusts to the country, and then the little we had was wiped out. Even hope was gone then. Why didn't the old folks pull up stakes and leave? It's hard to explain today. People nowadays are practical. Today nobody would believe it, and if he believed it, he wouldn't understand it, and if he believed it and understood it, then maybe he'd just laugh. It was like this: They thought abandoning the land was a terrible sin. They believed that a Jew who came back after two thousand years to work this land, if he up and left it, he'd get some terrible punishment. That the whole People of Israel would be punished. It was a powerful stubbornness! And maybe it was a little bit of madness, too. I don't know. I don't consider madness necessarily a bad thing. The Hebrew language — that was also a kind of madness at that time. There was great stubbornness; it's indescribable."

In the Land of Israel
Amos Oz
1983; 257 pp.
$5.95
($6.95 postpaid) from:
Vintage Books
Random House
Attn: Order Dept.
400 Hahn Road
Westminster, MD 21157
or Whole Earth Access

The First Thousand Words in Russian

Perhaps I'm devolving, but I find I like picture books more and more, and long wordy tomes less and less. I found this book in the children's section of the library, and it is a gem. It makes learning Russian delightfully fun, and these folks use the same book for German, French, Spanish, Italian, and English. —Glen Buschman



The First Thousand Words in Russian
Heather Amery
and Katrina Kirilenko;
illustrated by
Stephen Cartwright
1983; 62 pp.
$10.95
($11.95 postpaid) from:
EDC Publishing
P. O. Box 470663
Tulsa, OK 74147
or Whole Earth Access

wirelessness

A SPECIAL SECTION

A network without wires has been spun around us. It's an invisible yet tightening web, a tangle of long connections that tie our ears and eyes and minds together. Skimpy deposits of copper no longer keep the world from becoming neurological; skimpy management does. Massless, wireless channels must be budgeted, divided ever finer, and kept clear of massless interference — a management task.

Because the spectrum of this traffic is unseen, the allocation of power is happening without public attention. I find it noteworthy that the majority of the authors here paying attention see themselves as artists and not technicians. They have practice managing massless concepts. Robert Horvitz, our prize art editor, has been monitoring wireless communication for years. He collected and edited this special section in a matter of a few months.

One final, dissenting opinion from editor Art Kleiner, a compulsive wire user:

> *"Wireless" is a misnomer. In all but the most technical arenas, the distinction between "wired" and "wireless" is already so arbitrary as to be meaningless. The epitome of "wired" communication — a long-distance phone call between New York and San Francisco — is actually almost as "wireless" as a radio broadcast. Yes, it goes from your telephone to the local phone office on copper wires, but between phone offices it travels through the air on long-distance point-to-point microwaves. One of the major long-distance phone companies even took its name from radio technology — MCI was originally Microwave Communications, Inc. Not only that, broadcast radio and television programs are increasingly being delivered to the transmitters through the "wires" of the telephone network. Those distinctions between "wireful" and "wireless" will blur even more in the future.*

I'll wager the wireless component of the future is the greater half. The evidence? Read on. —*Kevin Kelly*

Satellites: EXTRATERRESTRIAL TOOLS

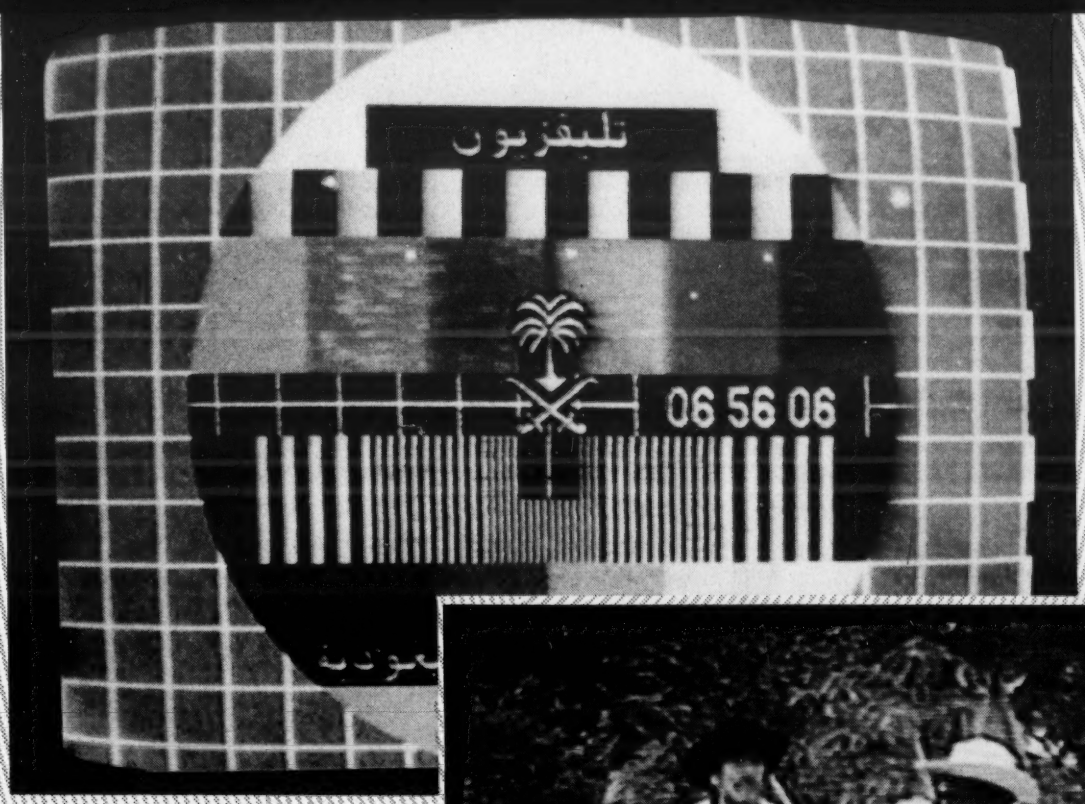
A Way to Travel Without Moving

by Mark Long

WORKING OVERSEAS HELPED ME STEP BEYOND my purely American viewpoint to realize that the world is inhabited by numerous peoples and cultures with their own unique traditions, values and aspirations. I felt some of these ways were equal or superior to those I acquired while growing up in suburban America. Once I was back in the U.S., however, it was far too easy to get mesmerized by narrow nationalistic concerns which fail to consider how the rest of the world lives. To keep my global perspective honed to a fine edge, I employ a backyard full of dish-shaped antennas, each directed toward one of 40 telecommunications satellites which are accessible from my home in rural Florida. With the aid of my satellite antenna "farm," I gain access to more than 200 television channels from 17 countries.

For all its faults, the Farm commune in Tennessee nurtured a far-sighted attitude about advanced communication technology: that it could easily be appropriate for radical, low-rent, decentralized do-gooding. Farm longhairs weren't hestitant to try projects shorthaired squares knew you needed a million dollars merely to think about. Building an earth station on a hay field didn't seem much different than making CB radio work, or installing a dependable radio link with Central American outposts — projects the Farm successfully engineered. In the center of this technical fury was Mark Long (no longer on the Farm), now a leading international expert on global satellite communications of all kinds.

—KK



Test pattern for a Middle Eastern channel.

Peruvian historical documentary.

All photos by Mark Long

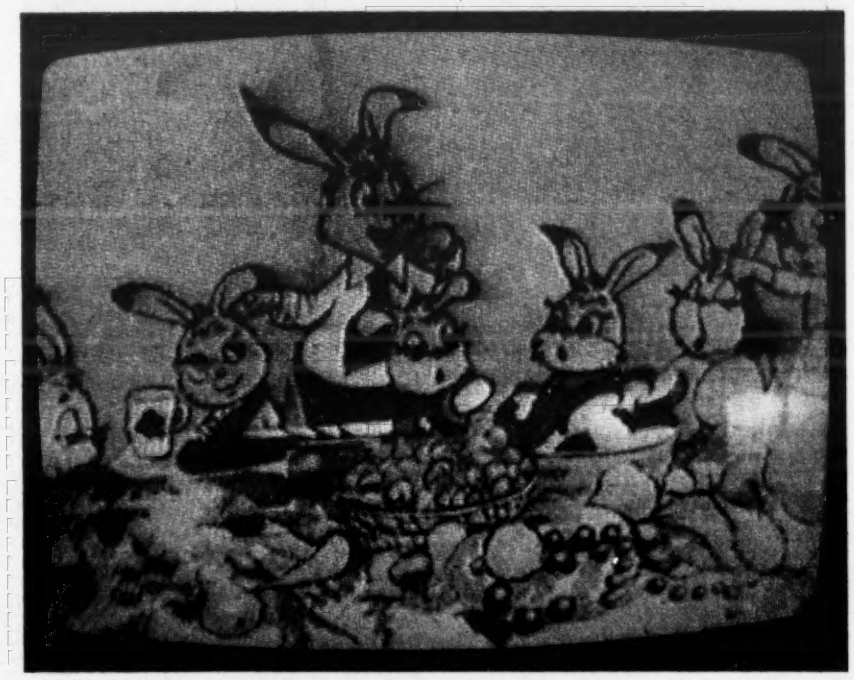
To receive foreign TV news programs, I maneuver my dish to catch signals emanating from Satcom F1. Channel 11 carries the early and late evening news from ITN London every day at 12:45 and 5:45 p.m. EST. On the same satellite, Channel 24 transmits the RAI Evening News from Rome weekdays at 1:45 p.m. EST. The daily Visnews and World Television News (WTN) roundups from London also appear on this satellite at other times of the day.

My favorite channel these days is on Telstar 301, which carries Russian news programs from Moscow. An American company known as Worldview receives the Moscow Evening News each day from one of the Soviet satellites and then retransmits it via Telstar 301. The Russian-language soundtrack is translated into English and the Russian TV signal is converted to the NTSC video standard so American TV sets can resolve their program in full living color.

From watching this and the untranslated Soviet channels I get the clear idea that Russians are human beings just like the rest of us. They don't look any different, and many of their activities, like celebrating the holiday season with Christmas trees, or searching for a good mechanic to fix their automobile, are universal experiences. On the nightly news spots you see them sending their kids off to summer camp. You watch the weather, and you get to see the temperatures in Siberia, which kind of freeze you right there.

I see the whole culture of the country, from the programs the kids watch in the mornings to the exercise programs. I can watch documentaries that cover both the present five-year agricultural plan and chess championships. The Russian satellite is not just used by the Russians; it's also shared by the Warsaw Pact countries.

One day I was watching a feed channel on the Russian satellite coming from some place in Europe. The usual off-the-air color bars disappeared and then there was Cindy Lauper singing "Girls Just Want to Have Fun." I wondered what was going on. By checking other satelites simultaneously (I have more than one dish), I found they were taking Lauper off Satcom 3, an American satellite, and transmitting her back to the Soviet Union. It wasn't going out live on Soviet television. It only got as far as the Soviet engineers in the control booth. The conjecture is that they use these shows as a way to entertain the engineers at the various satellite relay complexes around the world. Perhaps they tape them and take them home for the kids. Last year



Russian cartoon program.

the Russians had a spy program much like the old TV series *I Spy,* only in this one the Americans (CIA) were the nasty bad guys, and the KGB were the good guys making everything all right.

One of the high points of having a satellite system is that instead of hearing news commentary out of the mouth of John Chancellor or Dan Rather, you can hear it out of the mouths of a number of different people around the world. You get to see their little pieces of the puzzle.

I believe that one of the most significant uses of international TV here in North America is to allow students to really be able to see what's happening culturally and economically in other countries. Recently I installed a satellite station at the Naval Academy in Annapolis that is used by Navy cadets to watch Russian TV in political science classes. Midshipmen who will be our future naval officers can see what is behind the Soviet government. By watching Russian TV every day, they see the people as they really are, which, I hope, will make our officers better able to relate to them on a more human level.

I discovered from watching international TV that satellites have a much greater impact on people in South America than they do here in the United States. Most of South America has no cable TV, and in many places they have no more than one or two, if any, broadcast channels. For them, access to programming from other countries via satellite is really very significant.

For example, most North Americans fail to understand the enormous impact and importance of Brazil in South America. We have no concept whatsoever of how sophisticated Brazil is. But if you watch their daily television programming, you immediately get a sense of the culture, significance and sheer magnitude of Brazil (with 135 million people it's the second most populous country in the Americas, after the U.S.). They have a wide variety of well-made programming and news reporting.

Some incredible political changes have been happening in Brazil. From my living room I watched their own TV broadcast demonstrations of hundreds of thousands of people marching in the streets. I could feel people's emotions as they began to have a direct voice in their government. To watch that developing and building up over a month's time, finally culminating in the election of a revisionist candidate was incredibly awakening. Measured by its impact on the world, Brazil is more significant than either France or Italy, but our TV ignores it. On the CBS News, Brazil might get three minutes a month. With my dish and extraterrestrial tools I can watch as much as I want. ■

Satellite TV Week

Decidedly the best listings for figuring out which program to watch when there are 18 satellites, each delivering three channels on average, in four time zones, beaming down 24 hours a day. Many other contenders' listings are muddled and unwieldy (they come out monthly or fortnightly; this arrives weekly). It has the neatest movie index, which notes every place and every time a particular movie will show. Can't miss it. —Kevin Kelly

[Suggested by Vince Kelly]

"A SONG IS BORN" ** (1948, Musical) Danny Kaye, Virginia Mayo. A group of academics writing a history of music finds its work interrupted by a nightclub singer on the run from the authorities. (1 hr., 53 min.)
Mon. *19 [G1]11:00 am; 23 [F3] 2:00 pm* ***Thu.*** *19 [G1] 3:00 am* ***Fri.*** *19 [G1] 1:00 pm; 23 [F3] 6:00 am, 4:00 pm* ***Sat.*** *10 [F4] 10:00 am, 8:00 pm*

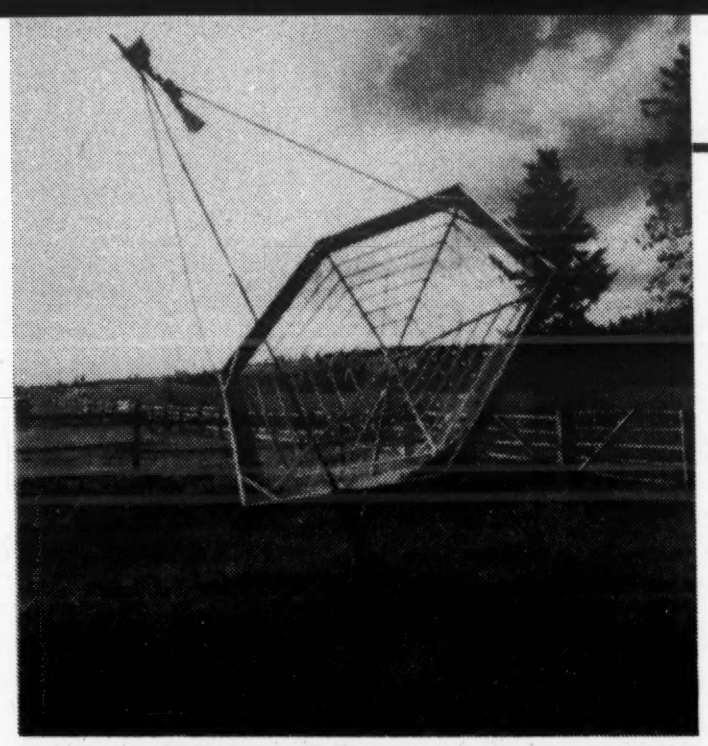
"SORCERER" *** (1977, Suspense) Roy Scheider, Bruno Cremer. Four desperate men risk their lives while hauling explosive nitroglycerine through South American jungles to battle an oil-well fire. 'PG' (2 hrs., 2 min.)
10 [G1]7:30 am; 10 [G1] 6:00 [G1] 10:30 am, pm

10 [F3] 10:30 am

"TESTAMENT" *** (1983, Drama) Jane Alexander, William Devane. The aftermath of nuclear holocaust -- from not knowing who launched the attack or why, to the horrors of slow death b radiation poisoning -- and its effects on a northern California family. 'PG' (Adult Situations) (1 hr., 29 min.)
Sun. *10 [G1]3:30 pm; 13 [F3] 11:00 am, 11:55 pm; 14 [G1] 6:30 pm; 23 [G1] 8:00 am, 8:55 pm* ***Thu.*** *13 [F3] 2:00 pm; 23 [G1] 11:00 am* ***Sat.*** *10 [G1] 10:00 am, 11:45 pm; 14 [G1] 1:00 pm, 2:45 am*

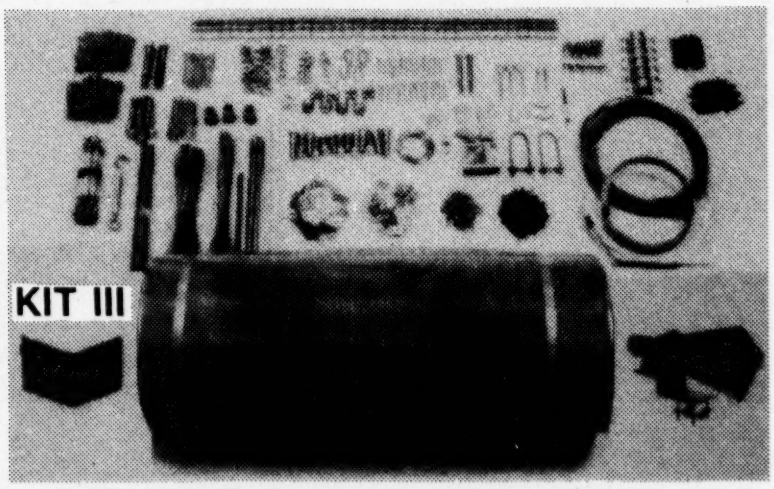
"TEX" ** (1982, Drama) Matt Dillon, Jim Metzler. With his caring, but impatient older brother, an Okla- eager experiences the wing up. 'PG'

Satellite TV Week
John Ponce, Editor
$48/year
(52 issues) from:
Satellite TV Week
P. O. Box 308
Fortuna, CA 95540



P-611 Satellite Antenna

Build your own backyard earth station antenna entirely from materials available from your local hardware store, lumber yard, and welding shop. The plans are for a strikingly handsome (for a change) and adequately large, 11-foot redwood "dish" with a galvanized steel cloth mesh. Depending on how good a scavenger you are, it'll cost between $300 and $600. If you have to buy the hardware fittings, this company's kit would probably save you money: they ship (via UPS) the cables, bolts, mesh, and feedhorn you need for $435. All this does not include the electronic amplifiers also required. The folks are very helpful. —Kevin Kelly



HARDWARE, SCREEN, FEEDHORN, POLARITY ROTATOR, CORNER PLATES, STEEL CABLE, RADIUS-WIRE, ETC.

P-611 Satellite Antenna Plans
$25 postpaid

P-611 Satellite Antenna Kit III
$435 postpaid

Information **free** from:
Ghost Fighters Inc.
3206 Highway 93
Stevensville, MT 59870

Jake's Discount Center

The rock-bottom lowest prices on satellite dishes. Usual mail-order trade-off is in effect — some bargains, some risk. We have no experience with them. It seems you can get something plugged in that would work okay in most parts of the country for about $1,000 complete. It looks dangerous if you have no idea what you want to buy.
—Kevin Kelly

Jake's Discount Center
Catalog **free** from:

Jake's Discount Center
P. O. Box 593
17 South 500 West
Brigham City, UT 84302

The World of Satellite Television

The big dummy's guide to installing, operating and maintaining a backyard satellite dish (by the authors of ***The Big Dummy's Guide to C.B. Radio*** *[**NWEC** p. 523]). A basic, sensible, essential initiation to a precision tool.* —KK

•

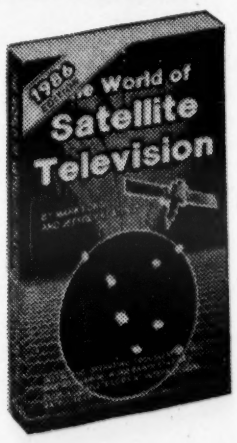
Satellite signals are microwaves that exhibit most of the characteristics of light, except visibility. Like visible light, they travel in a straight path along the line of sight. Since all geostationary satellites are positioned over the equator, if you want to receive them from the northern hemisphere, your antenna must have an unobstructed view of the southern sky. So, before you go running out and spending several thousand dollars for an earth station, you should be sure there are no tall buildings, trees, powerpoles, or other substantial obstacles to prevent the signals from reaching your dish.

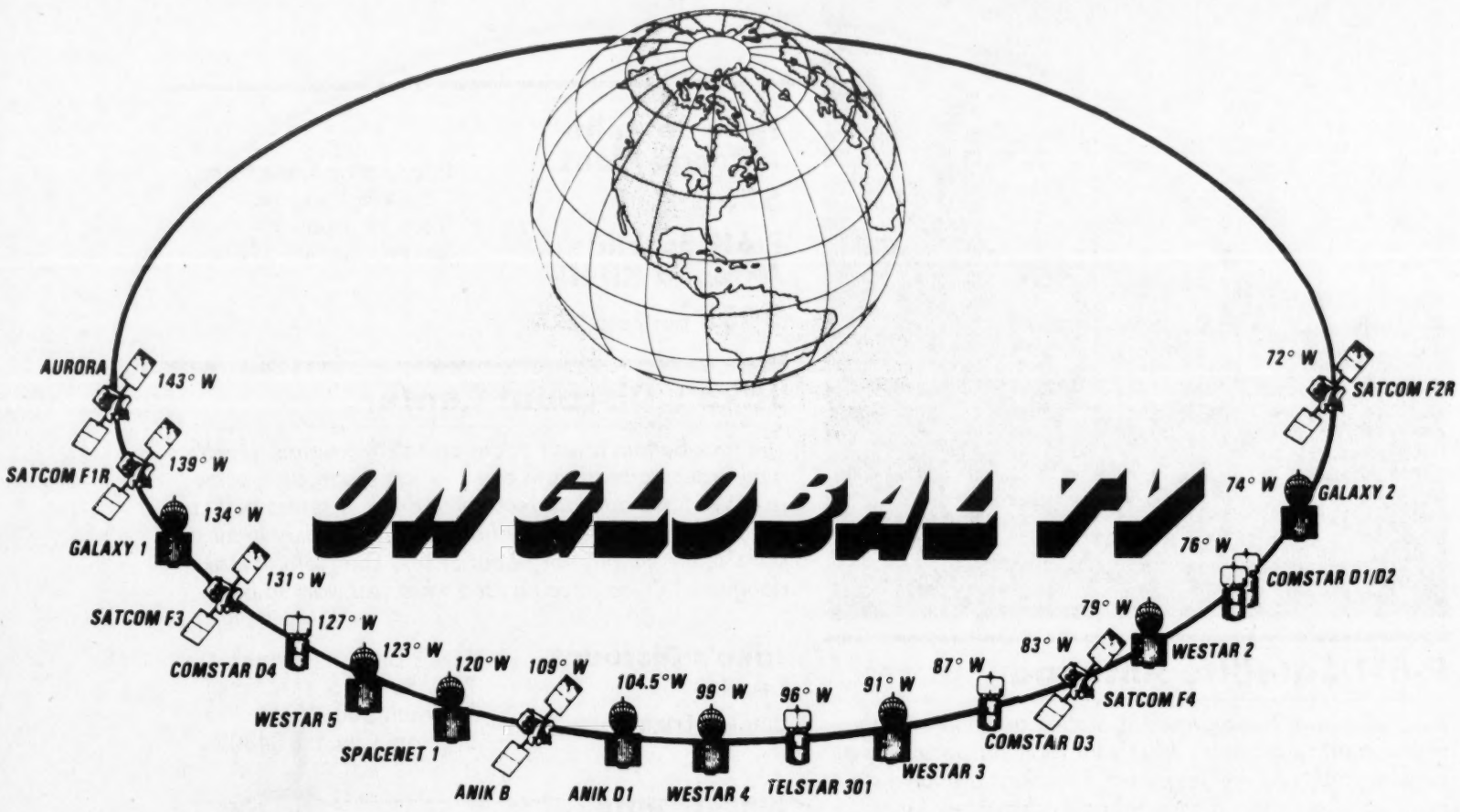
•

Symptom 11. Picture looks fuzzy, with the ghost of another picture on top of the channel you want.

What To Check. Your LNA polarizer is not completely tuning into the correct polarity. This could be caused by a bad power connection between the mechanical rotator and its indoor control mechanism. If electronic polarization is used, a bad cable connection or improper initial setup of the LNA/feedhorn could be the cause.

The World of Satellite Television
Mark Long
and Jeffrey Keating
1983; 224 pp.
$10.95
($11.95 postpaid) from:
Quantum Publishing, Inc.
P. O. Box 310
Mendocino, CA 95460
or Whole Earth Access





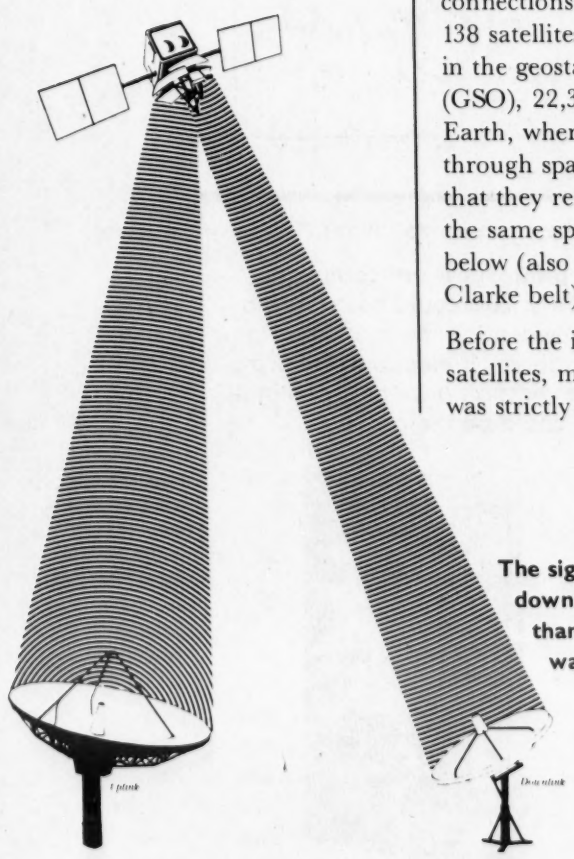
by Donna A. Demac

Donna Demac is a communications lawyer teaching in New York University's Interactive Telecommunications Program. She's the author of Keeping America Uninformed: Government Secrecy in the 1980s *(1984; 192 pp.; $8.95 from Pilgrim Press, 132 West 31st Street, New York, NY 10001). Her primary interest is in alternative applications of new communications technologies.*
—Robert Horvitz

FORTY YEARS AGO, Arthur C. Clarke had a vision. He imagined a world in which people could communicate directly with one another across the continents by portable wristwatch transmitters via satellites orbiting the earth thousands of miles above the equator.

Today Clarke's satellites are above us, shrinking the world through a dense network of voice, broadcasting and data connections. Approximately 138 satellites have been placed in the geostationary orbit (GSO), 22,300 miles from Earth, where satellites move through space at such a speed that they remain fixed above the same spot on the Earth below (also known as the Clarke belt).

Before the introduction of satellites, most broadcasting was strictly local; international television transmissions were only a dream. These "birds" serve as immensely high relay towers, making it possible to transmit continuously over a third of the Earth's surface.



The signal a satellite beams down is very weak, less than the power of a 100-watt lightbulb.

Satellites offer a veritable supermarket of commercial television. In the United States, we can now receive more than 70 television channels transmitted by satellite. In addition, corporate satellite networks are being established at a rapid pace, making possible video teleconferences such as the one-day seminar on artificial intelligence hosted by Texas Instruments in November 1985, which included some 25,000 participants at 500 locations.

But slick entertainment and corporate networks are only part of the picture and hardly the most exciting aspect. A wide range of noncommercial organizations as well as individuals are employing this powerful new technology for educational, social and grassroots objectives.

Tuning In

In the mid-1970s, as Home Box Office made a splash (and lots of money) transmitting programs to cable systems via satellite, a number of backyard inventors found ways to make the technology accessible to individuals. Steven Birkill in Great Britain and H. Taylor Howard in the U.S. were the first to construct home-built residential television receive-only Earth Stations (TVRO) in these two countries. Many others followed their lead.

A decade ago John Zelenka was a musician working with electronic synthesizers. He had heard about Earth Stations and decided to build one himself. Zelenka, who now installs and operates satellite links on a full-time basis, says, "There must have been a fair number of guys like me. We opened up the skies. Of course, we didn't think about it at the time, but it makes sense that the TV generation would find ways for television to be a good tool. You can't communicate any better than what can be done with satellites."

Today there are over a million and a half residential Earth Stations in the U.S. While most people are excited simply by their abililty to bring in many more programs, these Earth Stations could become the "fourth network," a chain of individual links outside the blanket of one-way TV.

Amazing things can happen even on the way to a regular channel when the dish "grabs" something totally unexpected. Zelenka remembers looking for the Disney Channel in 1983

and coming upon raw news feeds on the Israeli invasion of Lebanon. At other times, viewers have caught network news reporters getting made up while waiting to go on the air.

Residential use of Earth Stations received a boost in the fall of 1984 with the passage of the Cable Communications Policy Act, which legalized TVRO reception under certain conditions. It is now legal to receive satellite signals without paying the programmer, if the signals are not scrambled and if no marketing system has been established for selling the programs to TVRO owners.

The programmer need not use any particular form of scrambling. The legal test is whether the company has taken "some reasonable measure" to ensure that no person may simply tune in without acquiring the necessary decoding equipment. If the signal is not scrambled, unauthorized possession may still be illegal if the company has taken steps to sell programs to dish owners at a fair price. Companies must also take "realistic" steps to advertise the price of their services.

The right to receive satellite signals goes beyond the question of marketing. The "piracy" debate comes down to a question of access to a basic public resource (the airwaves): Who owns the broadcast signals and for how long? Satellites, even more than traditional broadcasting, make this question incredibly complex. Across the world, this new form of communication is posing a challenge to existing notions of private property.

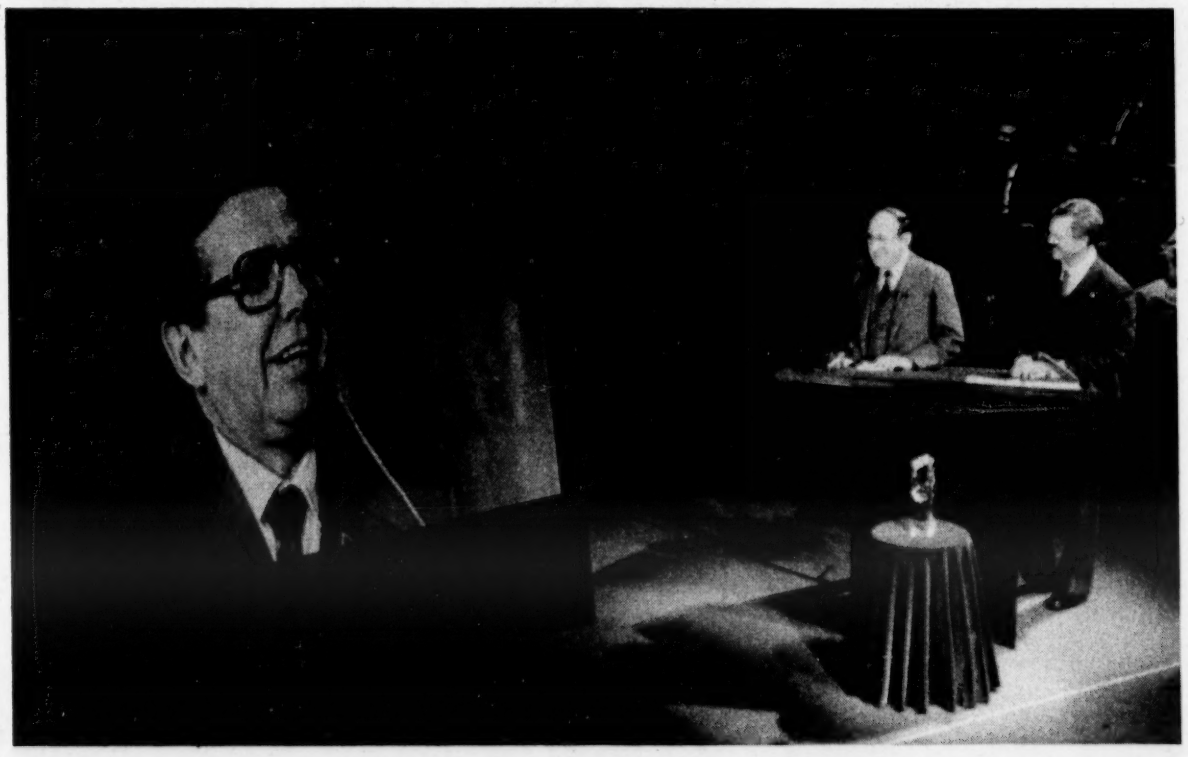
Say it with Pictures

Communication across diverse cultures and ideologies by means of satellites has already begun. In December 1984, a two-way teleconference brought people in San Francisco and Moscow together to give two eminent scientists of the International Physicians for the Prevention of Nuclear War the Beyond War Award for their contributions to world peace. The two scientists, who later shared the 1985 Nobel Peace Prize, were able to talk directly to one another and to the combined audiences of over 3500 people. The links of this live "meeting" spanned 11 time zones.

This event was the sixth "Space Bridge" produced by a company called Internews, run by video producers Kim Spencer and Evelyn Messinger. The global forum, rather than the corporate boardroom, is their focus. During the last three years, they have produced the "US Space Bridge" between rock concerts in California and the Soviet Union with music as well as open mikes at each end; the "Peace Child Space Bridge," linking children's theaters in Minneapolis and Moscow; and the "U.S. — Soviet Dialogue," a three-hour space bridge between studio audiences in Seattle and Leningrad, hosted by Phil Donahue and Soviet political commentator Vladimir Posner.

According to Messinger, the participants in these events are transformed by the experience of live two-way satellite communication. "It happens slowly. People first see others 9,000 miles away. Then, after noticing that these 'strange' Soviets have much the same hair styles and clothing that they do, they

The earth station on the roof of Columbia University in New York City, where students at the Harriman Institute watch Russian TV news and game shows.



"Beyond the War Spacebridge" brought together Dr. Chazov in Moscow (left) and Dr. Lown in San Francisco (right) for international peacemaking awards.

Orbita

The Russian weatherlady on Channel 11.

realize that they are being seen, too. It's quite a sensation."

Her partner, Kim Spencer, has been in the Soviet Union on each of these occasions. He says: "People here in the States, including PBS when we first tried to get money from them, were sure the Soviets would refuse. They were so sure, in fact, that they said there was no point in submitting a proposal. But the Soviets liked the idea from the very beginning. Each one of the Internews space bridges has been excerpted for Soviet television. If anything, the problem of resistance is more noticeable on this side."

Public television in the U.S. has since broadcast several of these space bridges. In addition, several other Americans are using satellites in an attempt to get Americans and Russians to understand one another better.

Ken Schaffer, an inventor and TV junkie, devised an Earth Station that receives programs directly off the Soviet Molniya satellites. The first one was installed atop Columbia University's Harriman Institute in New York, where students majoring in Russian studies watch hours of untranslated Soviet TV.

Schaffer believes that people like himself, who grew up in the TV generation, are better able to appreciate what he calls the "non-intellectual" potency of satellite communication. "I believe that the linear people who are running the world right now have no idea of what the power can be of millions of people sharing just silly little interactions," he says.

Schaffer prefers having people watch Soviet TV without English translation, believing this gets them more easily to the deeper levels of nonverbal communication. One of his favorite maxims is: "It is hard to hate a country when you get to know its weatherlady." Maybe you do need a weatherwoman to know which way the wind is blowing.

Developing Nations

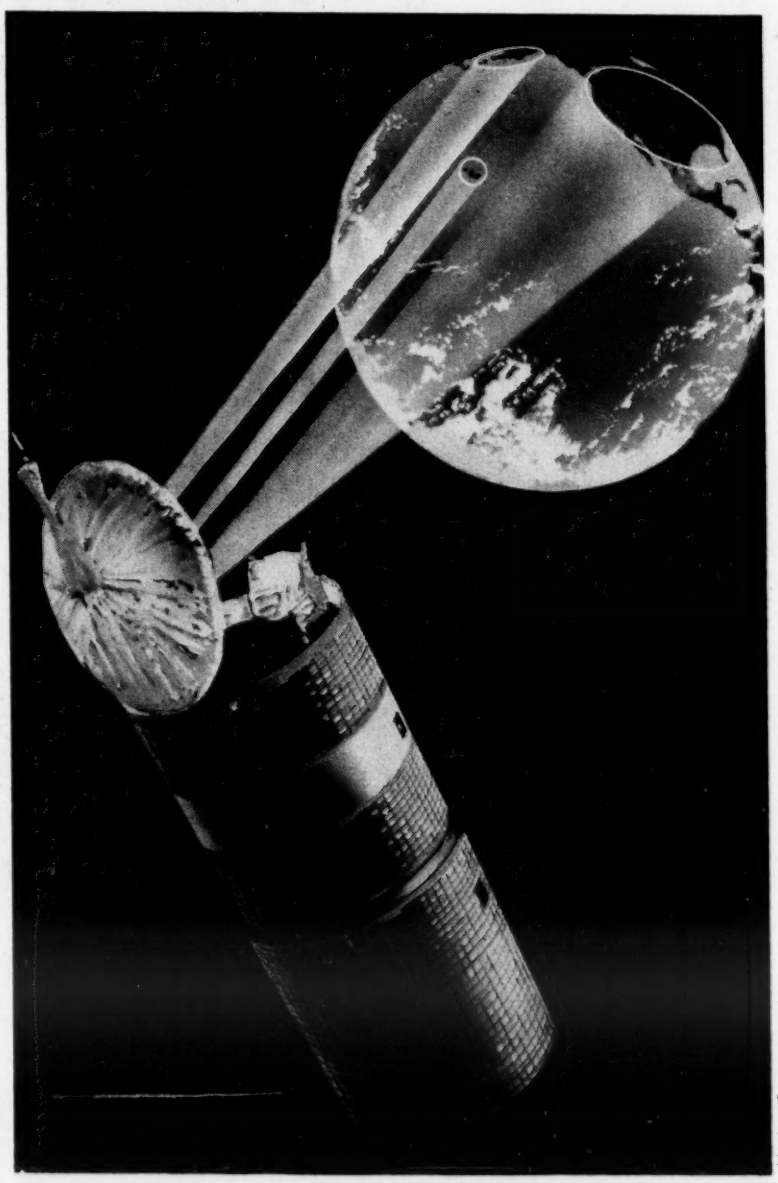
Alternative uses of satellites are also a hot issue in the developing world. Most Third World nations lease time on INTELSAT, a multicountry satellite consortium. India, Indonesia, Brazil, China and Mexico have their own satellites.

Satellites can bring basic communication service to a country faster than any other medium and are also of enormous importance during storms and emergency situations. In the South Pacific, the ATS-1 satellite has been used for consultation between tropical disease specialists and local health care providers during outbreaks of cholera and dengue fever. In 1985, they were also used to keep rescue workers informed following the chemical plant disaster in Bhopal, India.

The lack of progress in extending other telecommunications services to developing countries has made satellites even more attractive as a way to speed up national development. Although there are more than 600 million telephones in the world, approximately two-thirds of the world's population has no access to a telephone. Tokyo alone has more telephones than the entire African continent.

In order to cope with a range of intractable human problems, many planners in the Third World are making stronger efforts to determine their own communications goals and to acquire indigenous expertise. Y.S. Rajan, a scientist with the Indian Space Research Organization, has written: "Our own experience has demonstrated that it is essential for a nation to define its own goals. Full benefits from the application of such advanced technology as

One of three Galaxy satellites. Each one has 24 transponders, or channels. Each channel focuses its signal in a particular footprint on Earth.



Hughes Communications

satellites can accrue only if the culture-specific elements are not compromised but fully integrated in the process."

Third World countries want to expand new telecommunications facilities. But their hopes for creating indigenous capability quickly come into conflict with the overseas marketing plans of corporations from the United States, Canada, Japan and Western Europe. Once again, market interests and human needs are in conflict.

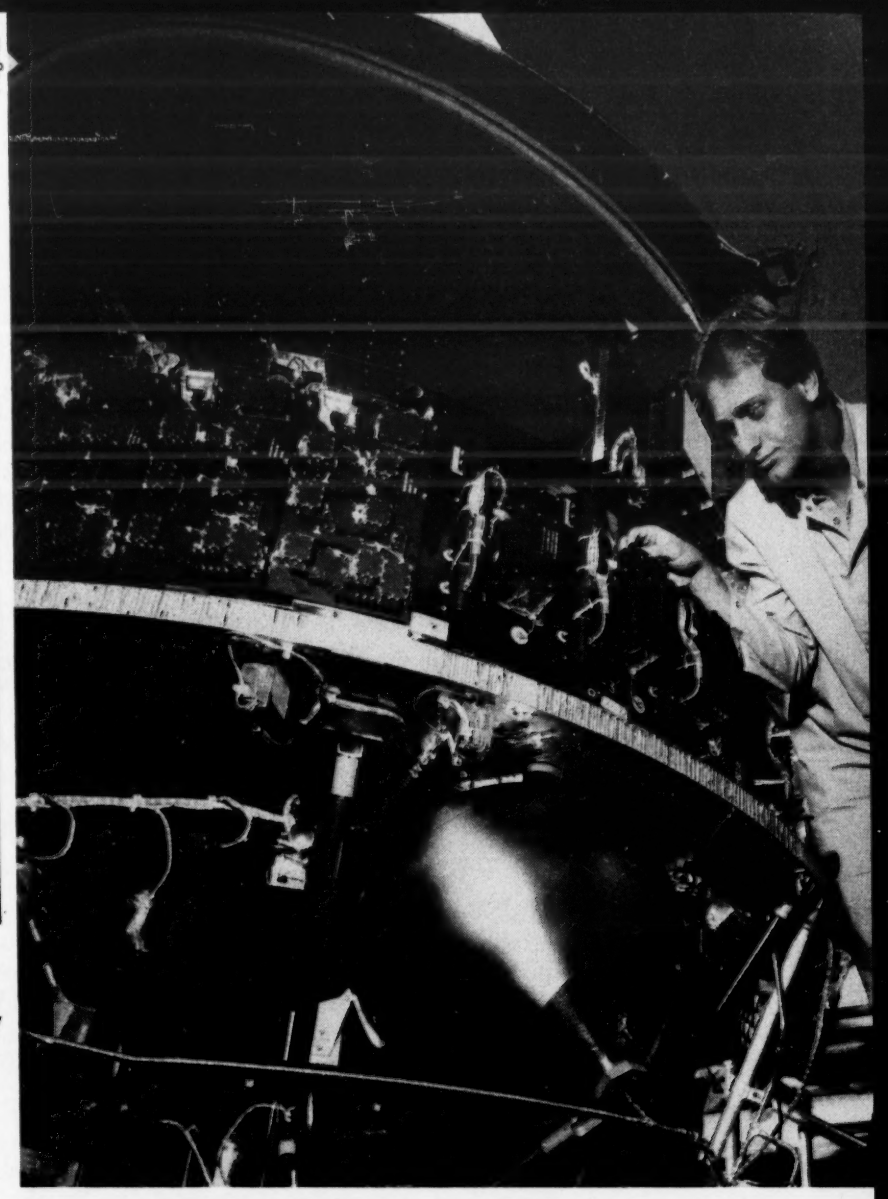
The Future

In some ways, satellite communication is still in its infancy. We are at a crucial juncture. On one side is the vision of space as a new profit center or as a giant battleground for the next generation of weaponry. On the other side are groups and individuals seeking to use the technology to promote economic development, peace and other socially beneficial objectives.

Among the latter group are people who are "tuning in" to the power of international communications that bypass both the major media and government bureaucracies. This is likely to continue. We may even realize a version of Arthur C. Clarke's "wristwatch" fantasy should residential earth stations become capable of transmitting as well as receiving signals.

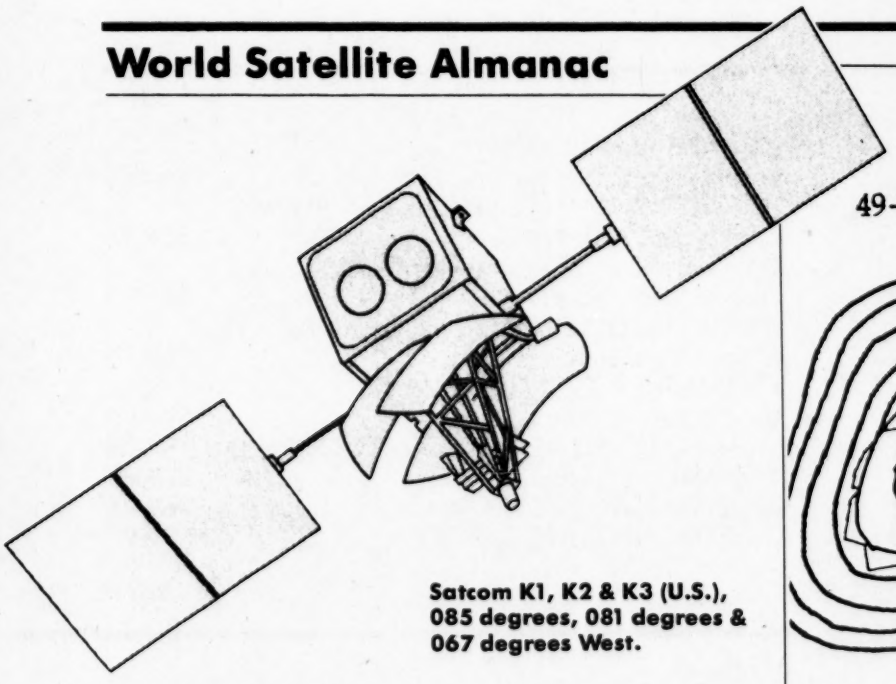
As Evelyn Messinger puts it, "Being there through television" is catching on. ■

Hughes

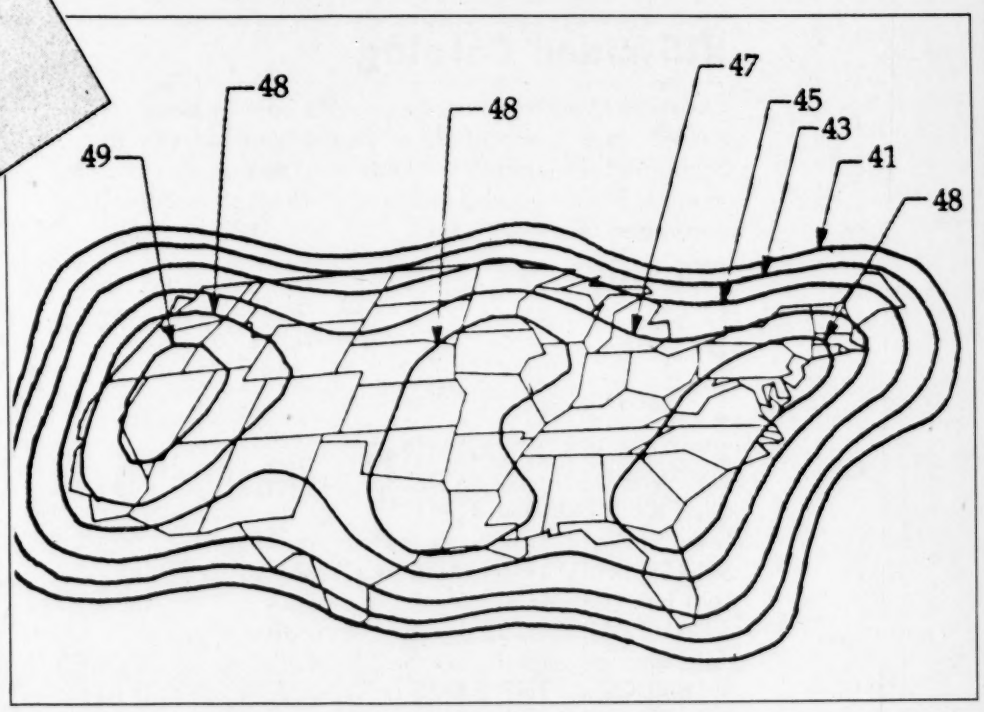


The electronics in Telstar 3, built by Hughes Aircraft, amplify the weakened signals it picks up from Earth and boosts them back through the spherical traveling wave amplifier at the bottom of the photograph.

World Satellite Almanac



Satcom K1, K2 & K3 (U.S.), 085 degrees, 081 degrees & 067 degrees West.

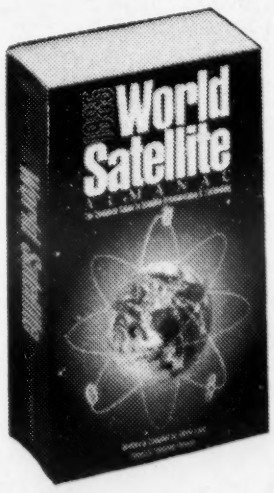


A directory to 70 manmade moons that beep back TV shows and messages in all languages of the Earth. A satellite hacker needs to know the frequency, the "footprint" (where the satellite's signal can be detected on Earth), and orbit of each bird. Russia? Brazil? India? This book has it all. —*Kevin Kelly*

•

XEW-TV, Channel 2, Mexico City. Mexico's most established television station offers a wide range of programming directed toward Mexico's middle class. XEW provides detailed news coverage of international and regional events throughout each programming day. The station also carries numerous musical entertainment programs as well as novellas and coverage of major sports events. This station is currently carried on transponder 11 (1) of the Intelsat V satellite now located at 53 degrees west longitude.

1985 World Satellite Almanac
Mark Long
1985; 544 pp.
$39.95
postpaid from:
Commtek Publishing Co.
9440 Fairview Avenue
P. O. Box 53
Boise, ID 83704
or Whole Earth Access



The Video Schoolhouse

How-to books, even the best, only guide you so far. At some point a how-to video tape, even a mediocre one, will open up better visual understanding (oh, so that's how it goes!) so that the skill moves from the head to the hand quicker. Someone has finally rounded up all the how-to video tapes available for sale (over 1,000) into a fat mail order catalog. They seem to include everything, poor to fair to excellent: sports coaching, health care material, dancing lessons, and the brightest of the Saturday morning TV do-it-yourself instruction. Self-education rewinds. —Kevin Kelly

The Video Schoolhouse
Catalog
$2
from:
Video Schoolhouse
805 Airport Road
Monterey, CA 93940

•

Wood Finishing/With Frank Klausz
Learn fine, durable finishes from 20-year cabinetmaking master Frank Klausz. Includes demonstrations on how to prepare an ideal surface for finishing; choose between oil, alcohol and water stains; apply tung oil or spar varnish for maximum wood penetration; spray lacquer; apply French polish; and even correct finishing goofs. (110 min.) CR026 ..... $59.95

•

Tai Chi Ch'uan with Nancy Kwan
The health enhancing "meditation in motion" of Tai Chi, a centuries-old Chinese spiritual exercise, is adapted from the classic maneuvers of the martial arts. Learn this fatigue-free, yet energizing exercise to develop breathing, and a balanced, relaxed posture. (75 min.) $59.00

•

Quick Dog Training
Barbara Woodhouse demonstrates and explains techniques she uses in her wildly successful dog training classes. (90 min.) PA022 ..... $59.95

•

How to Rebuild Your VW Engine
Video documentary, includes how to check for cracks, check case, warpage, align 40 hp rods, check cam and lifters, check deck height, do end play, assemble crank, assemble "bottom end," how to use a torque wrench, proper ring and piston placement, and much more. (2 hours.) AM022 ..... $49.00

•

Celestial Navigation Simplified
Willam F. Buckley is your dapper host on this comprehensive tape designed to help sailors navigate by the stars. (60 min.) BT011 ..... $69.95

RTS Video Catalog

Over 7,000 entertainment videos for sale by mail. That means lots of new and old movies, silent flicks, and the occasional documentary. I looked up several film favorites that our amply-stocked local video rental store doesn't carry, and they were here. —Kevin Kelly

RTS Video
Catalog
$1 from:

RTS
P. O. Box 1829
Novato, CA 94948

•

SPIRIT OF WEST POINT (1947)
NewWrld 9536, Glenn Davis, D. Blanchard ... $44.95
SPITFIRE (1943, BW, K)
Leslie Howard, David Niven, Rosamund John .. $24.95
SPLASH (R) DARYL HANNAH AS MERMAID (1984)
Tom Hanks, John Candy $79.95
SPLATTER UNIVERSITY (1984, Vestron)
deranged psycopath; horror $79.95
SPLENDOR IN THE GRASS (PG) NATALIE WOOD (1961)
WHV11164, W. Beatty $69.95
SPLIT IMAGE (R) PETER FONDA (1982)
EHE1322, Karen Allen, M. O'Keefe $69.95
SPLIT SECOND (G) Dick Powell (1953) $39.95
SPLITZ (1984, PG13, Vestron 4195)
campus teen comedy $69.95
SPOILERS (B&W, G) JOHN WAYNE (1942)
Randolph Scott, Marlene $39.95
SPOOKS RUN WILD (1941, BW, VY)
Bela Lugosi, Leo Gorcey, comedy (K) $24.95
SPRAGGUE (1984, USA215419)
Michael Nouri, Glynis Johnson, mystery $59.95
SPRING BREAK (R) PERRY LANG (1983)
COL 10513, David Knell $79.95
SPRING FEVER, VVE 4103
Susan Anton (1981) Jessica Walter $69.95
SPRINGHILL (TWE10068)
Sean Sullivan, Paul Bradley, Mell Tuck $54.95
SPRINGTIME IN THE SIERRAS (1947, BW, VY)
Roy Rogers, Jean Frazee $59.95
SPY IN BLACK (1939, England, BW, VY)
Conrad Veidt, Valerie Hobson $59.95
SPY OF NAPOLEON (1936, England, BW, VY)
Richard Barthelmess, D. Hass $59.95
SPY SMASHER (G) (1942, B&W)
Kane Richman, Sam Flint $79.95
SPY WHO LOVED ME (PG) ROGER MOORE, BARB BACH
FOX4638, James Bond $79.95
SQUEEZE PLAY (PG, 1979) $69.95
ST HELENS (PG) ART CARNEY $79.95

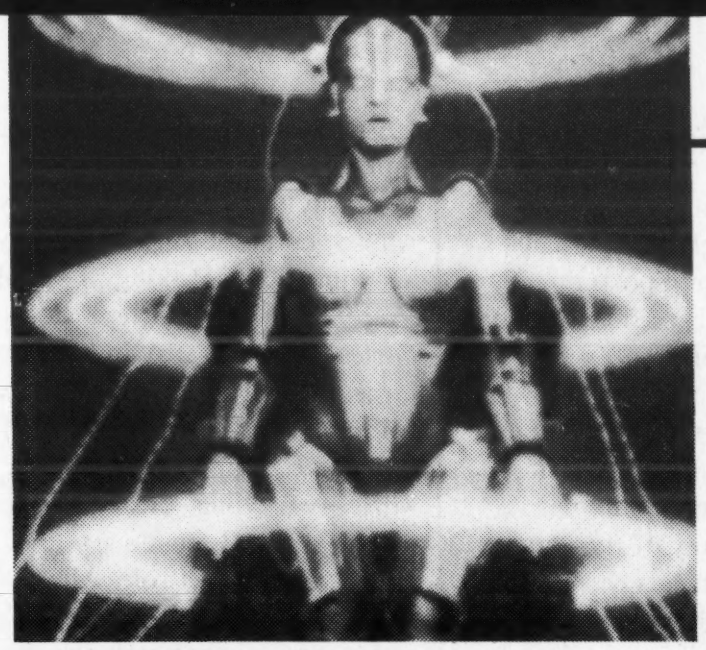
Video

Mainstream fascination with the newest home video gadgets and gossip flows wide and shallow in this supermarket slick.

The bountiful ads are where the news is. No better place to hear the rumblings and power of the VCR invasion. —Kevin Kelly

•

The Incredible Shrinking Camera
Baseball fans can look forward to seeing their games from a totally new perspective next season. ABC Sports' new camera is small enough to mount on an umpire's face mask. It puts the viewer right behind the plate as a ball is hit. Conceived last April, the microcam was successfully tested at the World Little League Playoffs in August. "It's the first time we actually put a camera onto the field without affecting visibility or the game structure itself," says ABC Sports Vice President Dennis Lewin.



The transformation of a robot into human form in "Metropolis."

Video Times
Matthew White,
Editor-in-chief
$19.95/year
(12 issues) from:
Publications International
3841 West Oakton
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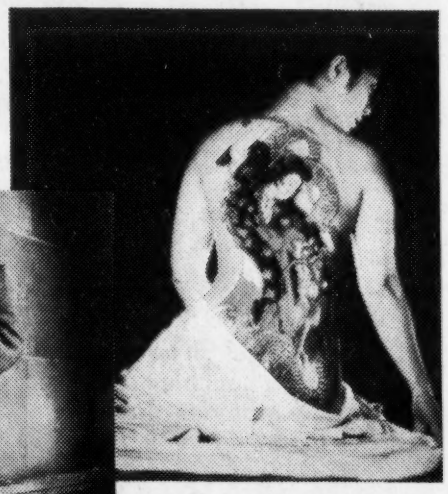
The artist's handwork is displayed on his subject's back in "Irezumi" (1982). Director: Yoichi Takabayashi. With Masayo Utsunomiya and Tomisaburo Wakayama. Subtitled. Color. Pacific Arts, $59.95.



Video Times

There doesn't seem to be anywhere to turn except to ***Video Times*** *for lively, intelligent reviews of material on video tape. In the evenhanded way* ***Library Journal*** *reviews all kinds of books, this earnest magazine is tackling anything on tape. Video cassettes transform TV and Hollywood material into personal theater (you choose what and when you watch), bestowing a relaxed intimacy to an otherwise harrying and manipulative medium. The magazine's broad reviews and groupings (drama, horror, documentary, experimental, etc.) reflect an emerging sense of video literature.* —*Kevin Kelly*

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It's in the Bag
Once in a while, a Hollywood studio would turn out a really demented comedy, and this is one of them. I used to catch this early on Sunday mornings on channel 9 in L.A., but now it must be something of a cult item because it seldom shows up anywhere. Fred Allen plays Fred Floogle, owner of Floogle's Flea Circus, who inherits a fortune stuffed into the lining of one of 12 chairs. He spends the movie tracking down that chair, running into all sorts of oddball characters in the process, including Jack Benny. . . .

•

In the spring of 1935, before the film went into production, Thalberg, as an experiment, decided to send us all out on a stage tour to test some of the gags. We tested key scenes in front of theater audiences. The stage show was called "Scenes from a Night at the Opera." It was a four-city tour, playing to several movie houses. . . . We did five shows daily, for six days a week. The show lasted about eight weeks. —Groucho Marx

Fred Allen nearly escapes injury in the wacky comedy "It's in the Bag."

Maureen O'Sullivan, Allan Jones, Groucho Marx, Chico Marx, and Harpo Marx in "A Day at the Races."

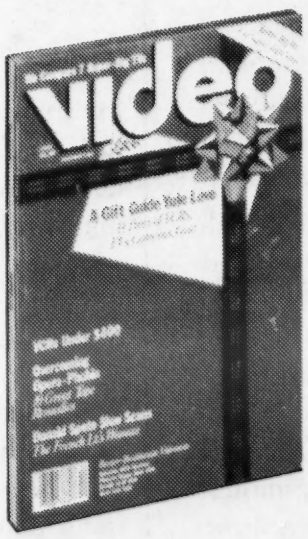
•

There is a subculture of video freaks in this country whose sole purpose is to collect tapes. Most are not the hardware videophiles who want to collect every new gadget and have the latest state-of-the-art machine. These vidheads are less interested in how their machines record than in exchanging two episodes of *My Mother The Car* and one *Crusader Rabbit* for a copy of *The Miss Nude Teenager Contest*.

•

Sony's new SuperBetamovie camcorder boasts a 20 percent increase in resolution. Sony says it has shifted the luminance carrier signal by 800 kHz to achieve the more detailed picture. . . .

Video
Doug Garr, editor
$18/year
(12 issues) from:
Video
P. O. Box 1118
Dover, NJ 07801



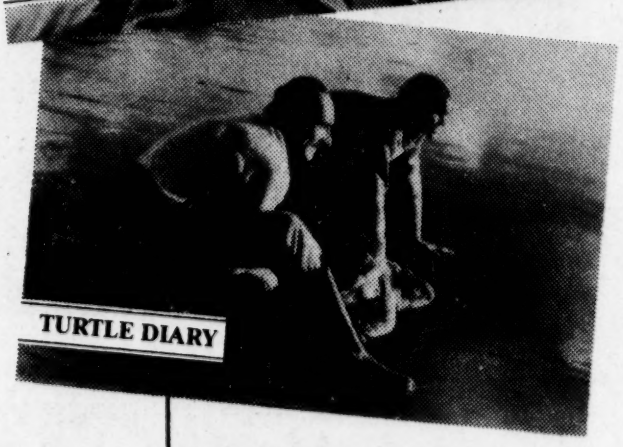
Sony SuperBetamovie.

by Sheila Benson

28-UP

TROUBLE IN MIND

HANNAH AND HER SISTERS


TURTLE DIARY

28-UP is documentary, but because of its range it's more gripping than fiction. It answers fiction's most intriguing question: how did their lives turn out?

"They" are the 14 lively British schoolchildren, poor, posh and in-between, interviewed by Granada Television in 1963 when they were 7 and at seven-year intervals until they were 28. ("35-Up" is planned.) The effect is like one of those stop-motion nature studies in which a flower goes from bud to bloom before our eyes. This mesmerizing work by director Michael Apted becomes a withering portrait of class and privilege and of opportunities taken and not, which shape a life forever. In the Swinging London of the early Sixties there was still a hope that the class system was crumbling; **28-Up** dispels any of that optimism. Nevertheless there are sturdy success stories among some of its non-U boys: the young Cockney jockey, now a proud husband, father and cabbie, whose next step may be to own his own pub; the boy from the Children's Home who has emigrated to Australia where he has quite clearly found himself. Not all is rosy: the sunniest 7-year old boy among them now tramps the roads with haunted eyes, homeless, self-defeating yet clearly bright and articulate. One of its two other most brilliant students has left England for lack of opportunity there and is now a teacher/researcher at the University of Wisconsin; three of the most privileged boys are also the most insufferable. (There was also a great boy-girl imbalance originally, 10 boys to 4 girls, which Apted has fixed somewhat by interviewing the feisty women these young men have married.)

28-Up's brilliance is in Apted's interviews and in the film's form, which ranges back and forth through these 21 years magically. You might particularly see this as a family; its overview of ages of rebellion followed by ages of maturity is somehow deeply comforting.

★ ★ ★

TROUBLE IN MIND is **Choose Me**'s writer-director, Alan Rudolph, at his most assured. Here he creates RainCity, a spellbinding world of the near future, full of greed, corruption, nobility and romantic sacrifice, a sort of post-modern **Casablanca**. Its charms include a pair of lovers (Kris Kristofferson, Lori Singer) whose future you care about desperately, and the most cautionary view of the wiles of the big city since **Sunrise**. Keith Carradine plays the easily-corrupted country boy whose venture into eeeeeevil ways has him finally looking like Phil Everly crossed with Mephistopheles — not an easy image to forget. Joe Morton is an eloquent voice from the city's shady side; Genevieve Bujold is Wanda, the world-weary diner owner, and a dinner-jacketed Divine gets the Sidney Greenstreet role. All of this and a haunting musical score and a fine Kristofferson song, "El Gavilan" sung by Marianne Faithfull.

★ ★ ★

What a lovely time Woody Allen must have had, filling the roles in **HANNAH AND HER SISTERS**. There's Mia Farrow as the pivotal Hannah, a successful actress but happiest at the center of a complicated, loving clan, including husband Michael Caine, sisters Barbara Hershey and Diane Wiest, parents Maureen Sullivan and (alas, the late) Lloyd Nolan. This is miraculously good Allen, casting a gentle and generous eye at the foibles of all involved, including affluent architect Sam Waterston, struggling actress Carrie Fisher, and Allen himself as a TV comedy writer forced into an examination of What It's All About. The answer is as pungently good as any guru's and a lot funnier.

★ ★ ★

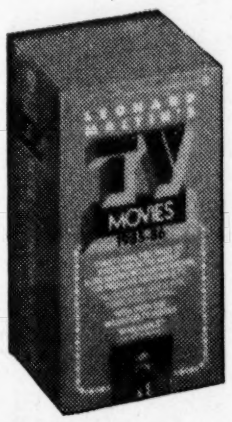
TURTLE DIARY seems to be one of those films about clenched Britishers so repressed they barely function — but it has twists as startling as smelling salts. The novel, by Russell Hoban, has been a sort of genteel underground favorite; the movie, whose screenplay is by Harold Pinter, is entirely faithful to the book's tone as two strangers, Glenda Jackson and Ben Kingsley, conspire to kidnap three giant tortoises from the London Aquarium and take them to the sea (shades of the Dr. Doolittle books). Whether they succeed or not is beside the point; the superbly performed **Turtle Diary** is really about a triumphant, quiet kind of self-liberation. ■

Leonard Maltin's TV Movies

The boom in home video has spawned its own guidebook industry. Everyone from Pauline Kael to Roger Ebert has a book of reviews designed to help the viewer find his way through the video marketplace. The standby in my house has always been ***Leonard Maltin's TV Movies*** *[also recommended by Sheila Benson —KK]. This $5 volume lists over 16,000 films, making it the most comprehensive guide available. Videophiles, late-night TV addicts, 8- and 16mm collectors, and those lucky enough to have a neighborhood repertory house will find Maltin's capsule reviews and 4-star rating system right on target.*

—David Burnor

Leonard Maltin's TV Movies
1985-86 edition
1984; 1,021 pp.
$4.95
($5.95 postpaid) from:
Signet Books
New American Library
120 Woodbine Street
Bergenfield, NJ 07621
or Whole Earth Access



ing discovery of prehistoric fish whose blood turns a college professor into rampaging beast.

Monster That Challenged the World, The (1957) **83m.** **½ D: Arnold Laven. Tim Holt, Audrey Dalton, Hans Conried, Casey Adams. Imaginative special effects improve this chiller about oversized water monster.

Monster Walks, The (1932) **63m.** ** D: Frank Strayer. Rex Lease, Vera Reynolds, Mischa Auer, Sheldon Lewis, Sleep 'N'Eat (Willie Best). Campy old-house thriller, good for some fun. Heiress Reynolds is

ing stars try to support thin story of troubled romance between two compulsive gamblers; filmed on location.

Monte Walsh (1970) **C-106m.** *** D: William Fraker. Lee Marvin, Jeanne Moreau, Jack Palance, Mitch Ryan, Jim Davis, Allyn Ann McLerie. Melancholy Western with Marvin a veteran cowboy who finds himself part of a dying West. Sensitive filming of novel by Jack Schaefer (who wrote SHANE). Fine performance by Palance in atypical good-guy role. Directorial debut for noted cinematographer Fraker.

Montenegro (1981-Swedish-British) **C-98m.** *** D: Dusan Makavejev. Susan

How TV works.

Electronic Arts Intermix

What used to be underground television occasionally flickers now on living room sets as MTV. These polished techniques of TV-dream were tried out by obscure video artists years ago. They continue to pioneer. Their current work, and their best old tapes, can be bought or rented from this video art archive catalog. *—Kevin Kelly*

Electronic Arts Intermix Videotapes
Catalog **free** from:
Electronic Arts
Intermix, Inc.
10 Waverly Place
New York, NY 10003

•

Why Do Things Get In A Muddle? (Come On Petunia) (1984) 32 min., color, sound. $75/300
Why Do Things Get In A Muddle? is based on a "metalogue" by Gregory Bateson, who defined the term as "a conversation on a problematical subject" in which the "structure of the conversation as a whole is also relevant to the same subject." With references to Alice in Wonderland, Hill creates an inverted world in which reverse language, startling camerawork, and a convoluted dialogue result in a "meta-illustration" of the Bateson text.

Technologies of Freedom

This book sums up a lifetime of reflection on the impact of electronic media. Until his death, author Pool was head of the MIT Program on Communications Policy Research. The focus of this book is easy to state: our tradition of free speech and free press has not been fully extended to electronic media for a variety of reasons, some still convincing, others not. As the center of cultural "gravity" shifts toward electronic publishing and electronic speech, will we lose that pre-electronic First Amendment tradition?

Pool answers the question by media: broadcasting, publishing, mail, cable television, telephony, etc. For each he reviews its evolution from the perspective of conflicts between freedom of expression and regulation of access and use. The language is simple, clear and largely non-technical. Since I am a believer in the need for some kinds of regulation of electronic media, I was all set to hate this book, but it won me over completely. There is a good case for minimizing regulation, and this is its strongest presentation to date. *—Robert Horvitz*

•

The idea of television over wires is an old one. As early as 1912 a sociologist of science, S. C. Gilfillan, published an article on "The Future Home Theater" outlining the two alternative ways of bringing television to the home, by radio or by telephone wires.

•

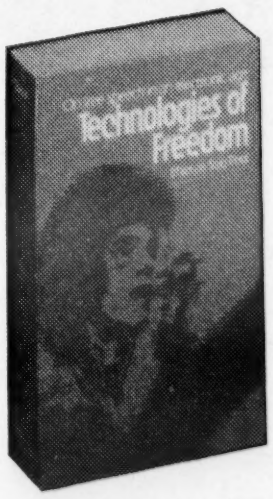
The paperless office or paperless society is probably a fantasy. Though for both storage and transmission, paper is likely to become a rarity because of its cost, the use of paper for display, reading, and current work may grow, partly in fact because it will not be economical to retain the paper copies. The paper industry has cause for optimism. Experience shows that when word processors are introduced into offices, paper consumption increases, since with a word processor it is easier, when minor corrections are made, to run a whole new version of a document than tediously to correct the old copies.

•

Electronic telephone directories make sense. Instead of chopping down trees to give each subscriber a large free book annually, the company would provide subscribers with keyboards on which to type in names, and then those persons' phone numbers would be displayed on a screen. Electronic yellow pages make sense, too. Instead of just looking up a listing of restaurants, subscribers could get a listing of the kind of restaurant they want, with information on the day's special or the current waiting line, and could even have an interactive way of making a reservation. The French telephone system is currently running an experiment with thousands of customers trying out on-line electronic directory services.

But under a clause that the American Newspaper Publishers Association (ANPA) lobbied into Senate bill S898 in 1981, electronic yellow pages are not allowed.

Technologies of Freedom
Ithiel de Sola Pool
1983; 299 pp.
$8.95
($10.40 postpaid) from:
Belknap Press (Harvard University Press)
79 Garden Street
Cambridge, MA 02138
or Whole Earth Access



PERSONAL
RADIO

by Robert Horvitz

Photos by Robert Horvitz

DURING WORLD WAR II, the U.S. Office of Strategic Services, the CIA's predecessor, developed a series of portable, easily-concealed radios for its agents in occupied countries. One of these secret radios was a hand-held voice transceiver enabling agents on the ground to communicate with aircraft. Hundreds of successful missions were flown by American and British bombers to targets spotted by agents using these "Joan-Eleanor" or J/E radios.

At the close of the war, Al Gross, the engineer who developed the J/E radios, demonstrated them for a group of Federal Communications Commission (FCC) commissioners and staff. The prospect of adapting the technology for two-way mobile use by the general public after the war was as exciting as it was obvious to those attending the demonstration.

Before the war, the only regular users of mobile two-way radios were police and fire departments, ambulances and other emergency services. But wartime research produced equipment capable of operating at higher frequencies. Not only was this newly-opened region of high frequencies many times larger than the previously available spectrum, but the radios designed for it could be smaller, more power-efficient, and easier to move around. Plus the range of these frequencies was limited, so the same channels could be used simultaneously in different places without causing interference. It was clear that the two-way communications needs of millions of people could be satisfied.

Citizens' Radio is Born

Anticipating commercialization of the technology after the war, the FCC proposed in 1945 to create a new "Citizens' Radiocommunications Service," later shortened to the "Citizens' Radio Service." This, unlike all previous two-way services, was intended to be widely available, without elaborate license requirements, occupational qualifications, or tests of knowledge. The FCC formally authorized it in 1948, giving Citizens' Radio Service all the frequencies between 460 and 470 MHz. "The possible uses of this service are as broad as the imagination of the public and the ingenuity of equipment manufacturers can devise," the FCC enthused.

By the mid-1950s, however, it was obvious the idea wasn't evolving as the FCC had anticipated. Most of the users of Citizens' Radio turned out to be businesses. Businesses had been authorized to operate in other parts of the spectrum, but commerical demand had grown faster than the FCC had expected. Since the restrictions on who could use Citizens' Radio were so weak, and public participation kept low by the high cost of the equipment, businesses moved in and persuaded the FCC to make their usurpation of the channels official.

In 1957, the FCC reallocated nearly 95 percent of the Citizens' Radio spectrum to businesses, public safety and other specialized job-related systems. A mere eight channels were left for what is now known as the General Mobile Radio Service. But the FCC did not want to kill the idea of a toll-free public two-way radio service completely, so they moved it to the 27 MHz band, a less-sought-after part of the spectrum where equipment costs would be lower.

At that time Ham radio operators held the 27 MHz band. They vigorously protested the idea of turning over some of these frequencies to Citizens' Radio. They argued — as did Al Gross, the original proponent of two-way wireless for everyman — that intolerable interference would inevitably result from using this part of the spectrum. Against this advice, the FCC reallocated the 27 MHz channels in 1958, and Citizens' Band Radio (CB) was born.

CB Free-For-All

Originally, CB radio was seen as a way for individuals and families to communicate with each other from fixed home bases, much like hams did. It wasn't until the Arab oil embargo and imposition of the 55-mile-an-hour speed limit in the early 1970s that CB radio began to take off as a mobile service. Truckers had dabbled in CB, but used it to find fuel and avoid speed traps; it became an essential part of their operations. CB quickly grew into a multibillion dollar industry. Millions of Americans discovered two-way mobile radio, and the FCC developed one of the biggest headaches in its history. Although CB's well-known abuses and disorder have been blamed on its becoming a fad, the basic design of the service was probably inappropriate for the communications needs of the public anyway.

CB's free-for-all, party-line format makes it impractical to allow such useful options as automatic interconnection with the telephone system, repeaters (more powerful, fixed-base stations that automatically retransmit weak mobile signals), selective calling (automatic addressing of messages that activate only one receiver), or trunking (assigning one conversation-pair per channel).

As the FCC itself concluded a few years ago, "the sharp and continuing decline in CB popularity . . . indicates not a declining desire for personal communications but that the licensees' needs . . . are not being met." ►

◄ *Messengers in downtown Washington, D.C., sport this highly-evolved tool kit: a beat-up bicycle and a mobile radio. Nothing can beat them for speed. After they deliver a package, they pedal madly down the street while they catch their next destination on their not-quite-wrist-size radios. They'll be the first to use hip-pocket personal radios, like the "Skybird" on the left.*

Tribune Media Services

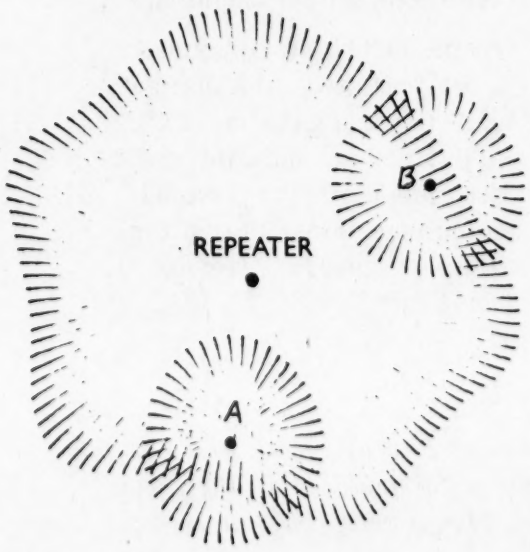
The first published appearance of Dick Tracy's Two-Way Wrist Radio, January 13, 1946.

Corporate Personal Radio

In 1971, the FCC proposed to create a new personal radio service in another band used by radio amateurs. Again the hams fought it, and this time they won. In 1977, the FCC dropped the idea and instead expanded CB from 23 to 40 channels.

Even with additional channels, CB still had serious problems. To help it find solutions, the FCC chartered the Personal Use Radio Advisory Committee in 1976. Most of PURAC's effort went toward untangling the CB mess, but a consumer-interest subgroup tackled the larger question of what the general public's need for mobile communications might be. They submitted to the FCC a detailed analysis of the issue with a variety of recommendations, including one that the commission set aside part of the unused spectrum around 800-900 MHz for a new personal radio service.

The FCC solicited comments on the proposal. Normally when they ask for comments, only lawyers representing businesses and special-interest groups that have a stake in the proceeding respond — even when the decision affects millions of people. This is particularly true in the case of mobile radio. But this time the FCC received hundreds of comments, mostly from individuals and most very positive about the idea.



Repeaters, usually located on hilltops, extend the range of small mobile transceivers and make possible the use of miniature, low-powered wrist radios. Here, "A" communicates with "B" via the relay of a stationary repeater.

But, in 1980, a change of administration transpired at the FCC, and with it a change of policy and personnel. Despite the obvious public support for the proposed service, it was put on the back burner where it might have languished forever but for the interest of the General Electric Corp.

General Electric (GE) had participated in PURAC from the start. When the FCC agreed to consider a new personal radio service at 800/900 MHz and public comments flooded in, GE began to sense the size of the potential demand for low-cost consumer transceivers and set to work on a system that would embody the PURAC, FCC and public recommendations. In 1982, they asked the FCC to authorize a cluster of channels for their Personal Radio Communications Service (PRCS).

The GE proposal was welcomed by the FCC, because it applied many of the lessons learned from CB and the General Mobile Radio Service, that sliver of channels left from the original Citizens' Radio. The basic PRCS unit consisted of a small base station (about the size of a ream of typing paper) that plugged directly into the telephone system, and a mobile station that could access the base either directly or through a repeater. A hand-held version was expected to follow, as repeaters came into wide use. Costing under $300 for a base-and-mobile set, it would be a lot like a cordless phone, but with much greater range and the advantages of selective calling and trunked channels. Each system was designed to protect conversation from interference and interruption. Sub-audible station identification and other forms of built-in orderliness meant the public could have a service that was more functional, flexible and sophisticated than either CB or cordless phones, yet easier for the FCC to regulate.

The GE proposal quickly became the talk of the industry. While commercial radio groups blasted the idea of allocating spectrum to the general public for personal use, competing equipment manufacturers tried to convince the FCC that the PRCS system was technically unfeasible. Motorola, the leading marketer of two-way radios, argued that PRCS could not possibly accommodate the numbers of people GE claimed would want it and would degenerate into chaos like CB. AT&T saw PRCS's interconnection with the wired telephone network as a direct threat to their already-substantial investment in "cellular" technology in which relay stations dot the landscape on a

honeycomb grid. (Unlike cellular, PRCS would supply mobile-to-mobile and mobile-to-base connections at no charge to users.) PRCS's decentralized structure and "best of both worlds" features were perceived as an attack on the traditional roles of both common carriers and two-way radio.

Meanwhile, hundreds of supportive letters poured into the public comment file. Nonprofit organizations and government agencies supported GE's proposal, including the U.S. Department of Transportation, the American Federation of Police, the National Urban Coalition, and the National Association of Towns and Townships. Apple and Wang computer companies supported it as a way to develop local wireless networks for personal computers.

However, by 1983, it was obvious that the 800/900 MHz band was going to be the last spectrum available for new mobile services for many years to come. Other requests for portions of the "reserve band" were filed. Airfone and Railfone wanted spectrum for payphones on airliners and trains. NASA wanted a large block of channels for a satellite-based mobile service it was developing with Canada. Ameritech Mobile Communications asked for more channels for cellular phones.

The intense lobbying for and against PRCS and the growing list of claimants for the 800/900 MHz band led to a series of delays in the FCC's decision. The delays proved to be too much for GE. They had budgeted $25 million to develop the service and the money ran out. In November 1984, they notified the FCC that although they still believed in PRCS, they had decided to put the project up for sale. This gave the FCC a convenient "out," and three weeks later, the commission decided not to create a band for PRCS. The FCC said it would consider allowing PRCS to use cellular frequencies in areas not served by cellular, but since those are primarily rural and uninhabited areas, no equipment manufacturers were interested.

Even though PRCS fizzled, it played a pivotal role in the evolving notion of mobile communications for everyone. It was the first time that large amounts of corporate money had been spent to develop the idea in concrete form. GE and PRCS showed how smarter hardware and innovative design could remove some of the most serious limitations of CB, cordless phones and cellular and proved there was widespread support for such a service.

Truly Mobile Radio

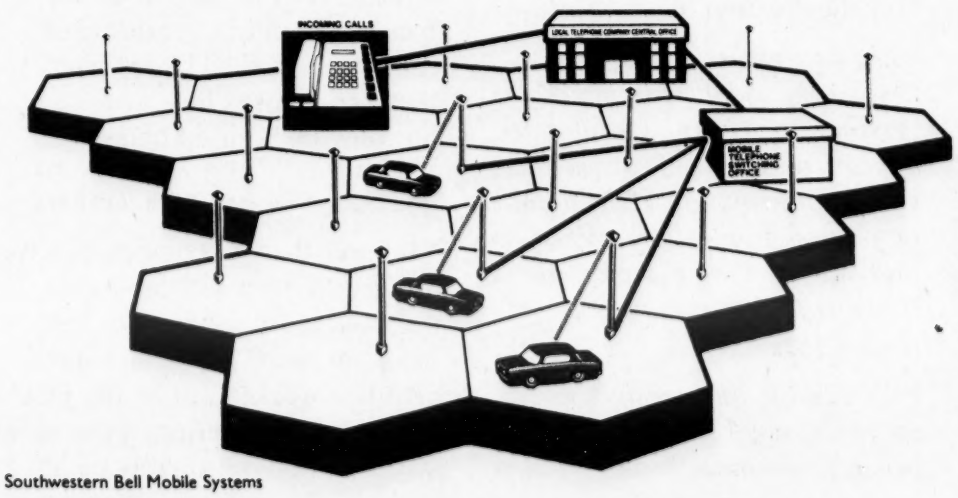
During this same period, cellular mobile radiotelephony was authorized. Its essential feature — aside from toll connection to the wired phone network — is the re-use of frequencies in adjacent zones or "cells" combined with a method for automatically "handing off" mobile users as they move from one cell to another. Although this is an inherently more expensive and cumbersome approach than GE's, it was "sold" to the FCC on the basis of its expandability. As more people subscribe, the cells can be subdivided, allowing more re-use of frequencies, creating the effect of more channels. So far cellular phone systems are operating in over 80 cities in the U.S.

Cellular systems are expensive to build, generally costing millions of dollars for switches, repeaters and networking. The mobile units are also expensive, costing $1000 to $2000, though prices are starting to come down. Beyond the hardware, at 40¢ a minute and up, cellular service is quite expensive, even for local calls. And cellular companies are finding that cell-splitting costs more than they said it would.

The FCC is concerned about the economic viability of cellular. Demand for service is very price-sensitive. There are a limited number of people willing to pay hundreds of dollars a month for the service; many more would be willing if it cost $25. But costs cannot drop substantially until economies of scale are achieved in manufacturing and utilization, and that can't happen until prices are cut, to increase use. Unless this Catch-22 situation is overcome, there may never be more than a few hundred thousand people able to afford cellular service.

International Connections

The British have a slightly different version of cellular. The Nordic Mobile Telephone (NMT) system is probably the most successful system anywhere. Currently operating around 450 MHz but soon to move up to 900 MHz, NMT is being adopted by many Middle Eastern and Asian nations. Its spread to other continents is potentially significant because NMT is part of a larger plan: it will go digital in stages and integrate with the French and



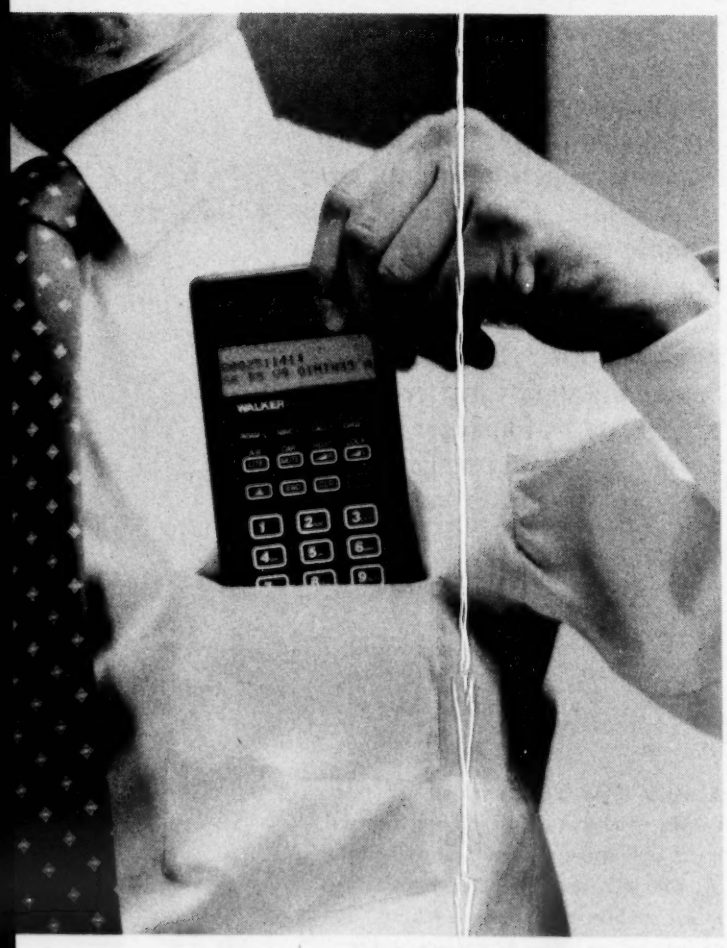
Southwestern Bell Mobile Systems

A city is divided into smaller geographical areas called cells, each served by its own low-powered radio transmitter. Cell sites are connected by wirelines to the mobile telephone switching office. As the caller drives across the city, the call is automatically passed from one transmitter to another, without noticeable interruption.

German systems, replacing not only traditional car-phones (which we call "radio common carriers") but also paging services, leading to a universal handheld digital communicator for both voice and alphanumeric messages that could be used anywhere in Europe. The Pan-European Digital Mobile Telecommunications System is the name of this grand design.

Japan has cellular telephony too, but perhaps of greater interest, they have a Personal Radio Service that grew out of their problems with CB.

Most CB radios sold in the U.S. were made in Japan, where the government didn't allow them to be used. However, millions of CBs never left the land of the rising sun as they were supposed to and chaos ensued. To bring the situation under control, the Japanese government authorized, in 1983, 80 channels around 900 MHz for a new trunked service based on low-power, hand-held units. No license is required because the power output is under 5 watts. The range of the radios (which cost about $250-$600) varies with the environment. In an urban center crowded with steel-skeleton and concrete buildings, the range might be only a few hundred feet; on the open road, it might be ten miles.



Walker Telecommunications

The Walker Pocket Cellular Phone, the smallest mobile phone so far. Weighs 15 ounces.

Instead of a license, each purchaser registers his or her name with the Society for the Promotion of Personal Radio, a group authorized by the government and the equipment manufacturers to assign call numbers. Each tone-coded number serves as an address for incoming calls, and an automatic identifier for transmitting. It is programmed onto a memory chip that is inserted in the radio and cannot be removed. There are 100,000 different numbers. Groups can arrange to have their members' calls share digits, to permit "all-calls," "any calls" and group discussions. That way, a member of the Osaka chess club visiting Tokyo can contact members of the Tokyo chess club without knowing any of them, if both clubs use the same initial digits in their calls. Such arrangements are apparently common. Two other nice features: The radio displays the number of the person calling you and has memory for often-called numbers.

The owner's manual for one of these radios (the "Skybird," model HR-8, made by NEC) describes how they're used in practice:

"The user enters on the operation keypad the 5-digit number of the person to be called. The number appears on the display . . . thus giving confirmation of the number before it is transmitted. When the press-to-talk switch is pressed, the called party's number is transmitted.

"When a Skybird receives its own assigned 5-digit number, it generates an audible tone to alert the user of an incoming call. In this manner, calls may be originated and received positively and automatically without the user saying a word.

"Before initiating a call, the Skybird scans the voice channels and selects a free one from 79 channels. The number of the selected voice channel is transmitted along with the 5-digit number of the called radio set [on the 80th channel, which is only used to set up calls on the other channels]. The call-originating radio then moves to the selected channel and the called set automatically moves to the same channel upon receipt of the call.

"Since voice channels are automatically selected by the equipment instead of the operator, jamming, interference and eavesdropping are virtually eliminated."

Automatic trunking and selective calling make Japan's Personal Radio Service different from our CB. But it's like CB in that repeaters are not allowed, nor is interconnection with the fixed phone system. Sales figures from late in 1984 indicate that about 50,000 of these personal radios are being sold *each month* in Japan with well over 1 million units already in use. Since the band these radios are designed for is used in the U.S. by hams, they can be used here as well, but only by licensed hams.

Reaching Everyone With Satellites

No fewer than 12 companies have applied to offer satellite-based personal radio services for the U.S., but many key details have yet to be worked out by the FCC. The primary beneficiaries of such a system would probably be in-

terstate truckers, airplanes and all those outside the range of terrestrial repeaters (i.e., thinly populated rural areas). Canada is especially interested in this type of system. Compatibility between the U.S. and Canada is obviously desirable, but an agreement for both countries to use the same parts of the 800 MHz band for up-links and down-links recently fell apart under pressure from existing terrestrial land mobile interests in the U.S. The future of both the U.S. and Canadian systems is uncertain.

Mail by Radio

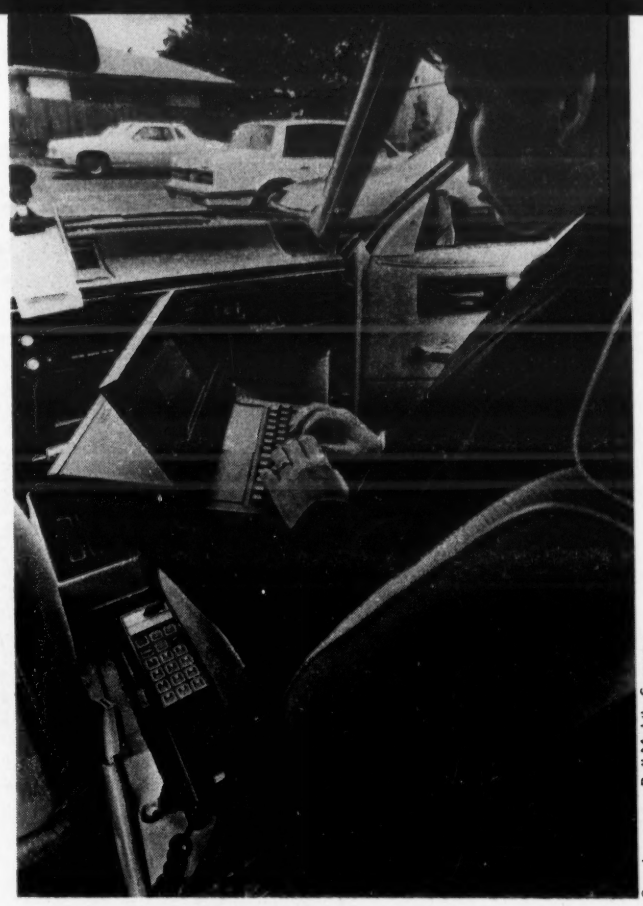
Another new factor is electronic mail. So far we've considered only real-time communications. But as the cost of solid-state memory goes down, storing and forwarding short voice and text messages that don't need instantaneous delivery becomes a convenient and often cheaper alternative (see "Packet," p. 47). FM broadcasting stations have always had some excess spectrum on the edges of their audio channels. A few years ago, the FCC began allowing them to use this spectrum to distribute information of any type: Stock market data, elevator music, reading services for the blind, whatever. Indesys, partly owned by the American Broadcasting Corp., uses the ABC radio network's FM stations for wireless delivery of electronic mail and computer software in competition with Compuserve and other wireline network services (see "Wireless," p. 22). The Mutual Radio network recently announced a nationwide service called Multi-Comm, which combines satellite links and local FM subcarriers to distribute audio, text, data and software to individually addressable, desk-top receivers within range of some 1700 FM stations. (For details, contact Mutual Satellite Services, 703/685-2171; for Indesys, 415/940-6077). Paging services with pocket-size receivers able to display and store short alphanumeric messages are spreading rapidly as well.

But to return to the familiar realm of real-time voice, the only personal two-way radio service currently open to all in the U.S., aside from CB, is the General Mobile Radio Service.

Although it's not exactly a household name, GMRS is the fastest growing land mobile service. Ray Kowalski, chief of the FCC division that regulates it, estimates that there are now about 37,000 GMRS licenses, roughly half of them individuals and families, the other half businesses. Anyone over the age of 18 is eligible for a license. There's no test to pass, no occupational restrictions. All you have to do is fill out a form and buy the same type of radio used by businesses licensed for adjacent bands (around 460 MHz), but "crystalled" for GMRS. These units cost anywhere from $350 to $2000 — the low end of the scale being a third the cost of a cellular phone — and you don't have to pay anyone by the minute for airtime. However, you cannot patch into the telephone grid on GMRS, and the channel quality is poorer than cellular — sometimes because of the bullish behavior of the commercial/industrial users of GMRS.

For most other land mobile services, you qualify for a license by being in a certain line of work — taxi, police, power company, forest products. GMRS was originally created for everyone not otherwise eligible for a land mobile license. However, when the FCC took away 95 percent of the spectrum given to the old Citizens Radio Service, they decided to let businesses eligible for other bands use GMRS, too. As a result, individuals, families, neighborhood crime patrols, and other community organizations that have no other niche in the communication spectrum are pitted against messenger services, tow trucks, private guards, radio dealerships, and other businesses that do — an unfortunate situation that has preempted use of GMRS by individuals in many parts of the country.

The non-business users of GMRS have organized and asked the FCC for relief several times since the 1970s. When the GE proposal was under consideration, the commission, in effect, said, "Don't worry. When the Personal Radio Communications Service is created, all your problems will be solved." Then the PRCS was defeated, and recent changes imposed on GMRS, ostensibly to improve the situation, have further limited its usefulness to nonbusinesses.



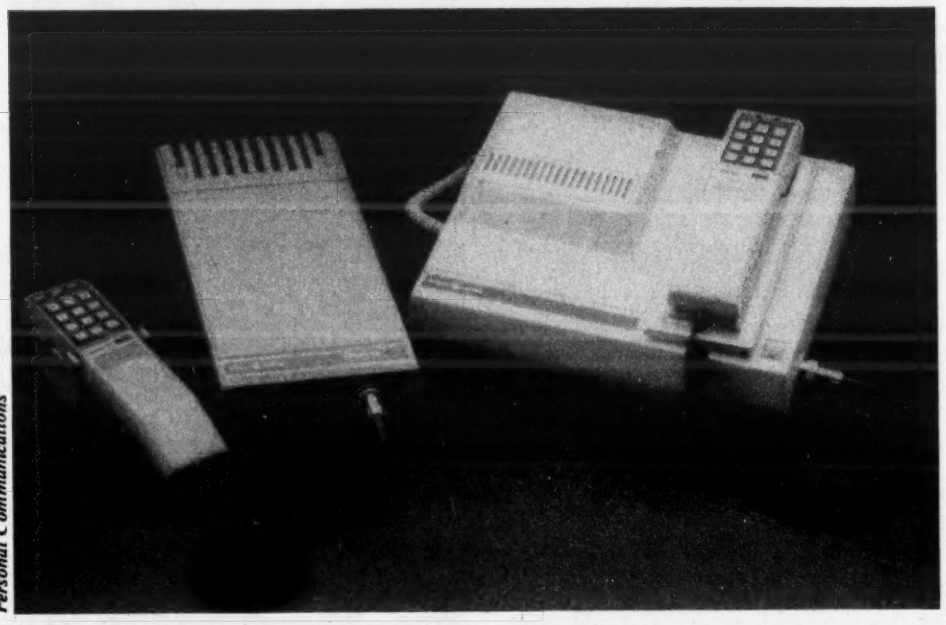
Southwestern Bell Mobile Systems

Long streams of text and numbers, such as reports from the field, can be telecommunicated via a computer linked to a car's cellular phone. Southwestern Bell was the first to develop the modem-like device to connect computer to cellular phone: $695 at each end of the wireless circuit.

"What we've seen at the FCC in recent years is no different from the James Watt approach to environmental protection," explains Corwin Moore, Coordinator of the Personal Radio Steering Group (PRSG). "Many of the nonbusiness users of GMRS are people who need mobile communications, but don't fit into the FCC's occupational scheme, or aren't using their radios for profit. Most are refugees from Citizen's Band."

Randy Knowles, also of PRSG, adds, "A good example is the na-

James Donnelly



Personal Communications

The mobile half (left) and base station (right) of GE's Personal Radio Communications System. GE manufactured several hundred units and put up repeaters in Washington, D.C., and two other cities to demonstrate how the service (now defunct) would operate.

tionwide network of Radio Emergency Associated Communications Teams (REACT). Since 1962, REACT has sponsored teams that monitor CB channel 9 and answer calls for help. But as conditions deteriorated on CB, they found they couldn't rely on CB to coordinate their responses. GMRS has proved invaluable for many of these teams. Presently more than 200 cities in the United States have REACT or other public service repeater systems in operation."

"There are some 400 cooperatively-owned GMRS repeater systems now," Moore continues. "Most individuals join a co-op because it gives them wide-area access and coverage, and it typically costs under $50 a year. If you travel regularly, you can join several co-ops and use your radio in different cities. No one is making handfuls of money selling community repeater service, but we are demonstrating that a low-cost, decentralized, self-supporting economic structure is viable, even in the face of some very hostile commercial competition."

The 400 community repeater co-ops are the Personal Radio Steering Group's primary base of support, and PRSG helps new co-ops get started. This past summer, they filed a lengthy petition with the FCC outlining a strategy to reform GMRS and convert it in stages into a new "Personal Mobility Radio Service." Licensing would be simplified and limited to individuals and families. No new licenses would be granted to businesses, but existing business users of GMRS could continue. Those using the band would all switch to a narrower type of modulation so that more channels could fit into the same amount of spectrum, and automatic trunking and selective calling would be phased in. Repeaters would be upgraded to accept modern digital control techniques to further improve spectrum efficiency.

"Somewhere in the PRSG's proposal lies the future of GMRS," says Ray Kowalski. "I wouldn't expect the commission to go along with all that they've offered, but it does represent the most ambitious plan to change GMRS that could happen." The period for gathering public comments is expected to begin in the first quarter of 1986.

"It is impossible to overstate the importance of people writing to the FCC to tell them what they want," says Corwin Moore. "The commission's scope of vision extends no further than the documents filed in each proceeding. If people don't say what they want, they surely won't get it, and they won't have anyone to blame but themselves."

"We were terribly disappointed when the commission decided not to authorize the GE system. This petition to reform GMRS is basically a change of tactic. Rather than trying to create a new service from scratch, which would require a new bureau to administer it, we think we have a better chance of achieving our goals by upgrading the existing service that is most like the one we envision. Revolution didn't have much appeal to the bureaucracy. We think we have a better chance with evolution."

An interesting aspect of PRSG's petition is that it challenges the conventional wisdom on the lack of channels for personal communications. Their argument goes like this: The only reason there's so little spectrum for personal use is because commercial and governmental systems use technology that is very old-fashioned and spectrally inefficient. A variety of new, narrow-band techniques have been developed and proven workable during the past two decades. If land mobile systems switched over to any one of them, enough new channels could be created to satisfy the needs of businesses, government *and* the general public. The U.S. land mobile radio industry has not shown much interest in adopting more spectrum-efficient techniques so far. The PRSG calls on the FCC to open an inquiry on the subject to prod them along.

James Donnelly

The Problem of Free Speech

Several issues lurk behind this entire discussion: The interceptability of radio-borne messages (lack of privacy) and the clash between the First Amendment tradition of free speech and the newer tradition of radio speech being regulated.

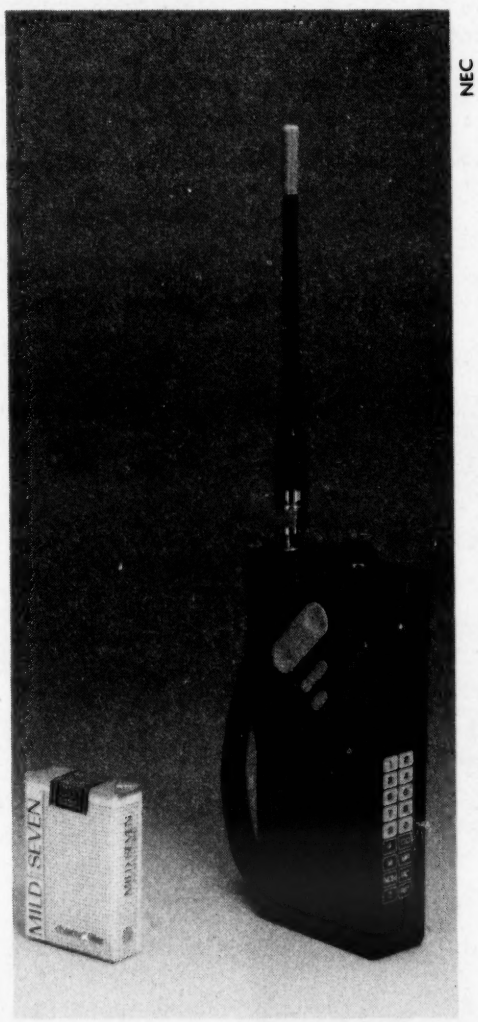
According to Benn Kobb at *Personal Communication Technology* magazine, "Wireless communication is vulnerable to intercept, but the FCC's policy has always been that if you're sending out a signal over a wide area, invading other people's spaces, actually, without their permission, and you don't want them to hear what you're saying, it behooves *you* to take steps to protect your message. If you walk down the street naked, don't rely on other people to shut their eyes.

"The people who've been using land mobile radio for years understand that their channels are open to intercept, and they adjust their habits accordingly. It's the people who are used to wire telephony, and think that it's totally secure, who have problems with wireless. The fact is, most long distance phone calls go by microwave or satellilte somewhere along the way, and they're vulnerable to intercept whenever they leave the wire. Every medium has vulnerabilities. The way to deal with them is, first, public education. Make those vulnerabilities known to the user. Like when the commission tackled the problem of cordless phones being so easy to monitor, the only practical solution they could come up with was to require all cordless phones manufactured after a certain date to have a little warning label: 'Privacy of communications may not be ensured when using this phone.' Buyer beware, in other words.

"This is a problem that should be resolvable in the market-place. Scrambling and encryption are the obvious solutions, ultimately, and they should be options available to those who feel they need protection. It may cost more, but not necessarily. If more use were made of digital techniques, you would get much more out of the spectrum, and much greater security as a byproduct."

The matter of free speech is trickier. Our basic communications law was passed in 1934. Since then, it has not been illegal to monitor point-to-point wireless transmissions. It is only illegal to divulge what you hear or to exploit the intercept for private gain. The law was crafted this way in recognition of the fact that any ban on monitoring per se would be unenforceable, since receivers are generally undetectable in use. The basis of the FCC's right to regulate wireless speech (which would otherwise seem entitled to some First Amendment protection) is the technical need to control radio *emissions*. Traditionally, reception has been less closely regulated.

On the other hand, the Omnibus Crime Control and Safe Streets Act of 1968 makes the wiretapping of phone calls illegal. The two laws conflict whenever a phone call is carried by a radio-wave through the open air, and this is an increasingly common situation.



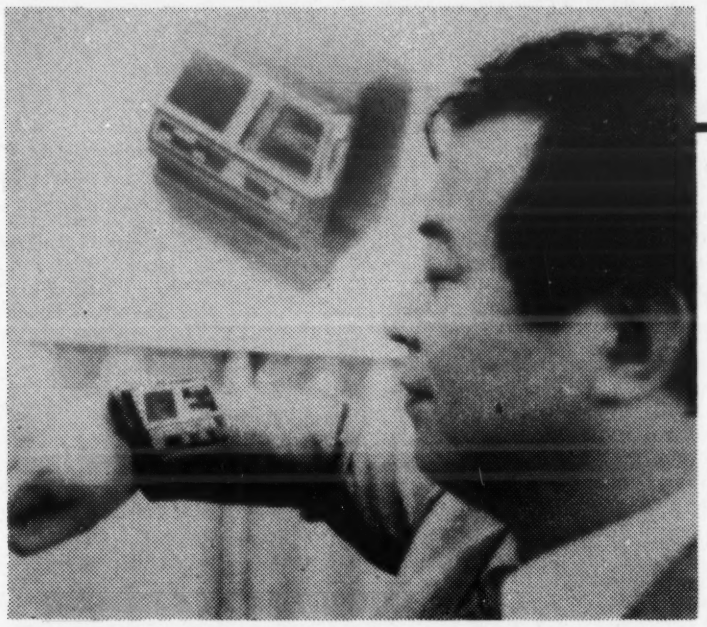
NEC

The "Skybird" personal radio, made by NEC (model HR-8).

James Donnelly

The House and Senate judiciary committees are considering legislation that would make it illegal to monitor most forms of wireless communication. The bills have the enthusiastic support of cellular phone companies and other wireless communications vendors because they would shift responsibility for protecting the privacy of their customers' messages away from them and onto everyone else within range of the signal. If passed in their present form, the bills would outlaw general-coverage shortwave receivers and scanners and make band sharing between broadcast and point-to-point services more difficult than it already is. "Protecting privacy is absolutely important," admits Benn Kobb, "but this legislation is unrealistic. There are already scanners in about 8 million homes. You're going to start seeing bumperstickers that say, 'When scanners are outlawed, only outlaws will have scanners.' And they'll be right."

We are constantly increasing our ability to take advantage of the radio spectrum. Its invisibility, and the sometimes complicated technical details involved in its use, have hindered public understanding of how radio fits into — or could fit into — daily life. The obvious trends toward small and cheaper transceivers, greater variety of transmission modes and applications, and international competition in developing new communications products guarantee that we'll be dealing with wirelessness much more in the years ahead. It's a shame Dick Tracy's creator, Chester Gould, died just as the game is getting interesting. ■

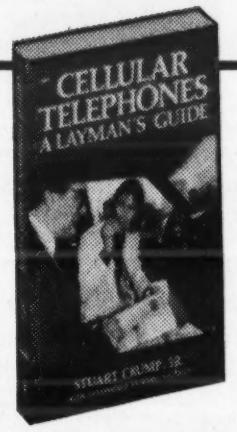


The telephone of the future may eventually be wristwatch size. The Dynam Enterprises Wristalkie two-way communicator is primarily a toy with a limited range, but it does give a hint of what a future wristwatch phone may look like.

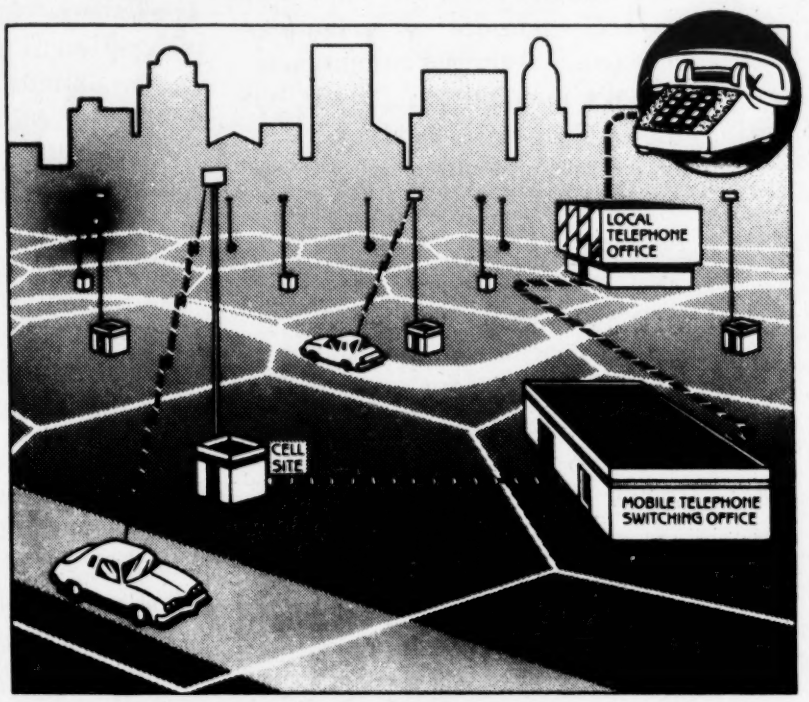
Cellular Telephones

When you use cellular phones, 99 times out of a hundred you'll be in a car, at least for the immediate future. This sketchy the-only-book-there-is book surveys the options, services and technology presently available.

—Kevin Kelly



Cellular Telephones
Stuart Crump, Jr.
1985; 146 pp.
$9.95
postpaid from:
Tab Books, Inc.
Blue Ridge Summit, PA
17214
or Whole Earth Access

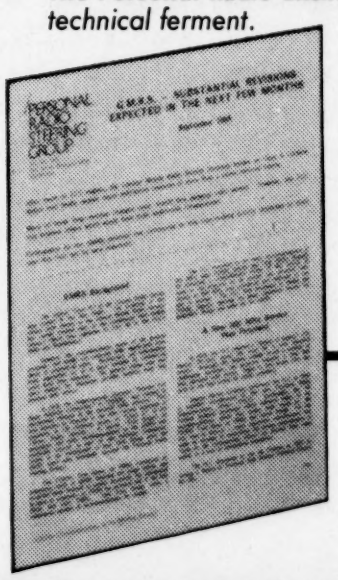


Cellular depends on a network of "cells" (indicated on this diagram by the hexagon-shaped segments) that cover a city. A low-powered radio transmitter and control equipment is located near the center of each cell. This cell-site equipment is connected to the "mobile telephone switching office" (MTSO), which is the gateway to the regular landline telephone network. When you place a car-phone call, the MTSO monitors the strength of your phone's signal at each of the cell sites near you. The closest site handles your call. As you move from one cell to another, your signal is automatically "handed off" to the next cell, giving you a clear, strong signal.

Personal Radio Exchange

Anyone interested in personal radio should contact the Personal Radio Steering Group. Their monthly newsletter, ***The Personal Radio Exchange****, is a hotbed of political-technical ferment.*

—Robert Horvitz



Personal Radio Exchange
$20/year
(12 issues) from:
Personal Radio
Steering Group, Inc.
P. O. Box 2851
Ann Arbor, MI 48106

Personal Communications Technology

The one place to go for information about this burgeoning field. The magazine was bought by a major trade publisher late last year. Too soon to tell if it will be able to maintain its visionary/missionary zeal and user orientation. Before its acquisition, it was one of my favorite magazines.

—Robert Horvitz

As you drive, the computer-map automatically updates itself second-by-second. Each time the car turns to face in a different direction, the map also rotates on the screen. As you approach a cross street, the name of the street appears on the computer map. . . . The Navigator is capable of showing you where you are within 50 feet — even after driving dozens or hundreds of miles.

Personal Communications Technology
Stuart Crump, Jr., editor
$25/year
(12 issues) from:
FutureComm
Publications, Inc.
4005 Williamsburg Court
Fairfax, VA 22032

UPLINK«»DOWNLINK

HOW TO USE SATELLITES TO DISTRIBUTE YOUR OWN PROGRAMS

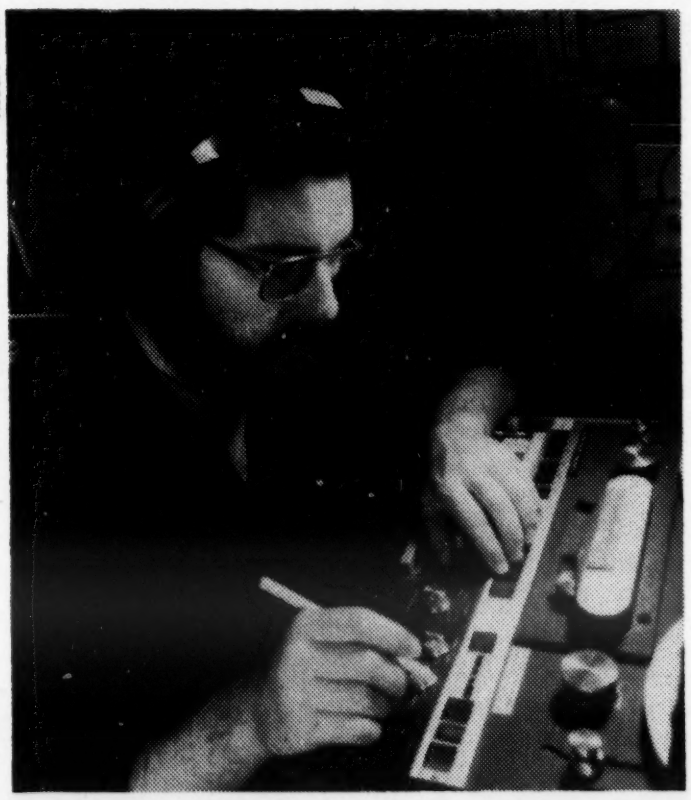
VIDEO UPLINK

by Douglas Cruickshank

Douglas Cruickshank spends his days as a filmmaker, book designer, and editor of The Fessenden Review, *a literary quarterly. His satellite primer is excerpted from an upcoming book called* Staking a Claim in the Cosmic Klondike: Being a Laymen's Guide for the Gaining of Access to the National and International Telecommunications Satellite Systems, *to be published in late 1986 by Mho & Mho Works, P. O. Box 33135, San Diego, CA 92103.*

Many who have written for this magazine have been collared by Phil Catalfo and steered toward making a half-hour radio program about what they know. As producer of a weekly radio series called "New Dimensions," Catalfo broadcasts these shows nationwide using satellites and cassettes by mail. A catalog of 1000 programs, featuring CQ/WER *regulars like Paul Hawken, Michael Philips, Ron Jones, and many others who slip my mind, is available for the asking from New Dimensions Radio, P. O. Box 410510, San Francisco, CA 94141. To pursue what he begins here, take up Catalfo's workbook* Beyond Production: A Guide to Marketing Your Independent Audio Production, *$26 postpaid from the same address.* —*Kevin Kelly*

Robert Welch



THERE ARE MANY WAYS individuals and groups can use satellite technology for little or no money. One specific avenue of satellite usage is to distribute films or videotapes to the 281 public television stations in the United States.

Film and videotape distribution is not very complicated, and it's extraordinarily cost-effective. A group of film- and videomakers could easily put together a six- or even 13-part series and distribute it via satellite for very little money. The same strategies and techniques also can be easily modified and used for the distribution of live or delayed satellite coverage of performances or other events, teleconferences and the like.

So why don't more people do it? Technological intimidation? Fear of failure or success? Who knows? I've never been able to figure that out. But the technology is in place and your tax dollars paid for much of the research and development that put it in place, so you might as well use it.

Who's Interested?

To find out if anyone is interested in what you have to offer, get a copy of the *Directory Of Information Sources For Public Television.* ($5 postpaid from the Corporation for Public Broadcasting, 1111 Sixteenth Street N.W., Washington, D.C. 20036; 202/293-6160.) This little booklet lists all the public television stations in the U.S., their addresses, telephone numbers, and the names of their program managers — the people with whom you'll be communicating. Assuming sufficient interest, you now begin the real work.

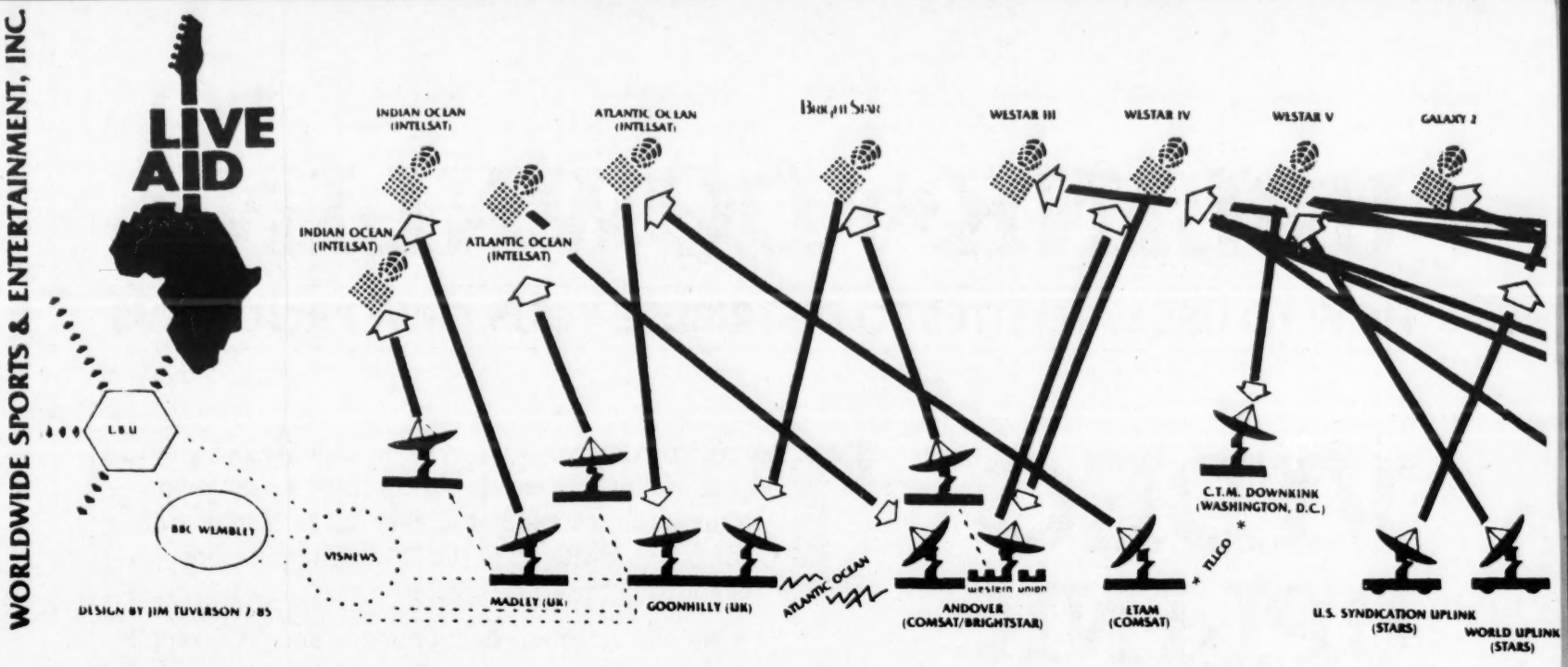
Getting It Up

The uplink is the large dish that sends the signal 22,000 miles into space to the telecommunications satellite, which in turn sends it back down to earth to be received by the individual station's downlink dish and then recorded for later broadcast.

There are fourteen uplinks in the U.S. affiliated with the Public Broadcasting Service. You will want to use one of them. While there are other uplinks that can get your program up to the WESTAR satellite used by PBS, the best financial deal will probably be through one of the PBS operations.

The uplinks are located in Tallahassee, Florida;

Phil Catalfo of New Dimensions Radio prepares a tape for satellite uplink.



Lincoln, Nebraska; Columbia, South Carolina; Hartford, Connecticut; Bloomington, Indiana; Detroit, Michigan; New York City; and in Virginia near Washington, D.C., among other places. The uplink in Virginia is known as the Main Original Terminal (MOT).

It's not necessary for you to live near or travel to one of the uplink locations. You can make arrangements over the telephone and ship your work to them for uplinking. But first you must schedule the time on the satellite.

This is the part many people assume is impenetrably complicated. It's not. It's far more complicated to book a commercial flight to Europe or get an appointment with the Department of Motor Vehicles. Here's how it's done: call PBS Broadcast Operations in Washington, D.C. and ask to speak to Ralph Shuetz, Director (his number is 202/644-3001), who schedules all independent use of the PBS transponders. Tell Mr. Shuetz what you wish to do, the length of your program, and the time you wish to feed it over the satellite. If that time slot is available they'll sign you up for it and mail you a written confirmation. If your desired time is not available, they'll suggest an alternative time. This whole process can also take place by letter.

Costs

This must cost a fortune, using satellites and those big dishes and all, right? Wrong. It doesn't have to. If you want to produce something of the magnitude of the Live Aid Concert, yes you're going to be laying out tens, perhaps hundreds, of thousands of dollars. But we're going to settle for reaching a potential audience of 240,000,000. We're going to start small.

PBS makes unspoken-for, or "occasional," time available to nonprofit organizations at a very low charge. You will pay a small administration charge of $50 per hour. Ralph Shuetz (who, by the way, has been and continues to be enormously helpful to independent producers) tells me that the administration charge is "negotiable" and is generally reduced if you're buying several hours of transponder time.

Your feed time will cost between $170 and $250 per hour. If you want prime time (defined as 4 P.M. to 2 A.M. weekdays and 1 P.M. to 2 A.M. weekends) it will cost $330 per hour. Additionally, you'll pay a $142 per hour uplinking charge. But you don't need prime time because it's highly unlikely the station will run your program as it's received. It will be recorded and then scheduled for later broadcast.

Including transfer of your one-hour film or tape to one-inch videotape, here's what we're looking at moneywise:

Transponder time:	$ 170
Uplink:	142
Administration:	50
One hour transfer:	380
60 minutes of one-inch tape:	150
Total	$ 892

When you consider the potential audience, it becomes clear that this is certainly the cheapest form of distribution currently available to independent producers.

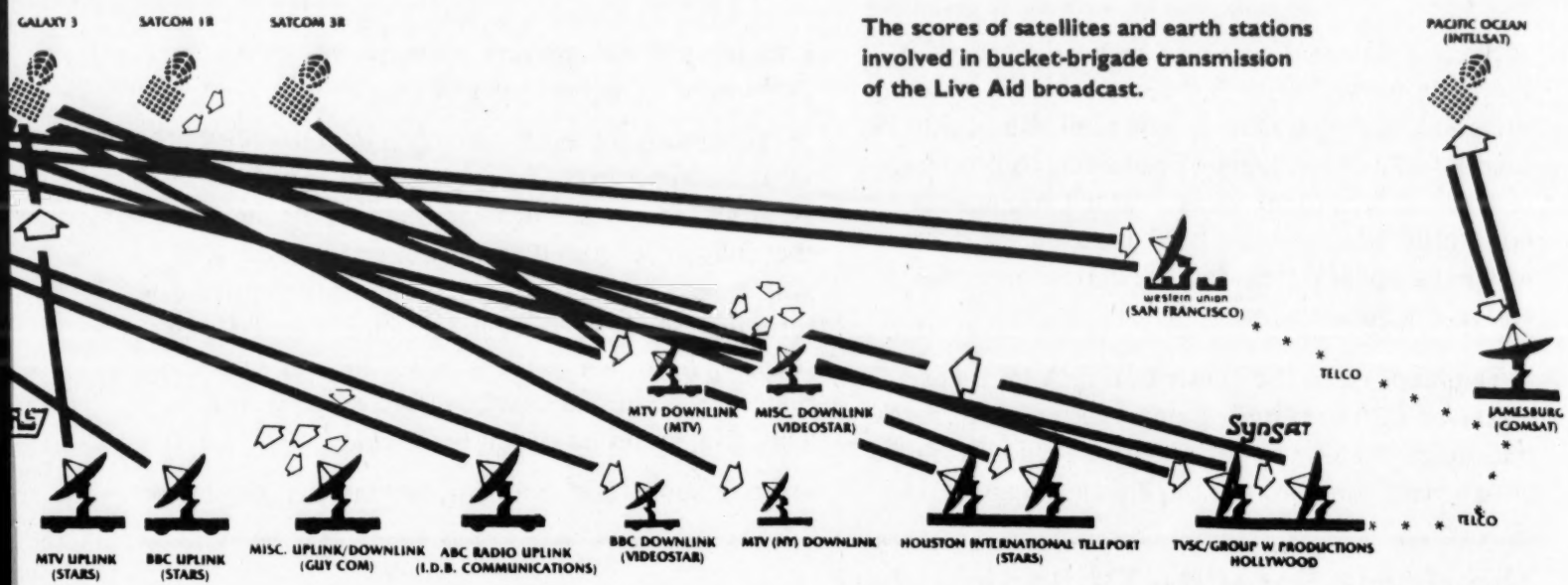
Revenue Return

How much money will you make? It's impossible to say.

I believe public television is seriously under-utilized by independent producers who expend great amounts of energy trying to get PBS to air their work and could just as well use that energy to distribute the work themselves using satellites.

As an example, you might charge a typical station $2.50 per minute or $145 per hour (assuming a 58-minute hour). If you sell to 25 stations at that rate you'll make $3,625. If you sell to WNET you'll make $1,798, so you see how a few sales to big-budget stations can add up.

While Jerry Mander contends that the medium of television is inherently bad (*CQ* #16, p. 38), I believe that television's poor quality has more to do with the nature of the bureaucracies that run it. In the case of public television, broader distribution of strong, interesting programs reflecting individual visions will add vitality to the bland, high-culture fare usually offered. ■



The scores of satellites and earth stations involved in bucket-brigade transmission of the Live Aid broadcast.

RADIO UPLINK

by Phil Catalfo

IMAGINE TURNING ON your radio in search of adventure. Better yet, imagine radio broadcasting as a means of sharing your adventure with others. Imagine leading a radio trip through your local flea market. Imagine your friends in New England providing an aural apprenticeship in making maple syrup. What do you do to brighten your life? Imagine *that,* broadcast to your entire state or time zone or country.

Imagine radio as a two-way medium, which is exactly what it is. Radios could act as our speakerphones in an ongoing, nationwide conference call. What makes this possible is the advent of several broadcast distribution options for independent radio producers. Principal among these is the Public Radio Satellite Distribution System, which has spawned dramatic proliferation of unusual and populist radio programs. They will air precisely the kind of fare which the broadcast industry's conventional wisdom buries in the "graveyard" of Sundays at 4:00 a.m.

One of my favorites is "Youth on the Air," a 15-minute weekly newsmagazine, the only national news program produced "by, for and about teenagers," usually to the accompaniment of a danceable beat and featuring healthy doses of kid-on-the-street interviews. Among other things, it shows kids that broadcast media are no bigger than they are. Never a huge hit, market penetration-wise, the program nonetheless continues in production and is quite popular in the Bay Area.

The public satellite radio system has made for some highly unusual program "events" as well, such as the "International Solstice Celebration," which provided live coverage of solstice happenings from around the world, and "Tunnel Hum U.S.A.," which mixed together the live sounds of small groups of people in New York and San Francisco, humming in resonant tunnels, in a given musical key.

All of these programs come from people who do not work for national broadcast networks and at one time were not producing radio programs.

There are some 1200 public stations in the U.S. (of roughly 10,000 radio stations total); as a rule these stations are far more open to less-than-mass-culture programming than their commercial counterparts. Of these 1200 stations over 300 are affiliated with National Public Radio, constituting the most extensive network in public radio. Besides producing its own programs, such as the benchmark "All Things Considered," NPR manages the public radio satellite schedule, administering access to satellite "channel space" for independent producers. NPR is your contact point for "getting on the bird."

The accessibility of the public radio satellite to independent producers — veteran, fledgling and would-be — means that the empowering technology of communications satellites is no longer the sole province of corporate megaliths. With the decreasing cost of satellite dishes and the gradual spread of direct broadcast satellite (DBS), "personal" satellite networks will proliferate as part of a long-term trend toward decentralization of electronic media.

The public radio satellite system can be seen as a model of such networks-to-be: It offers quality, nation-wide access (325 "downlinks" and 21 "uplinks" scattered across the country), and *affordability*. Rates for satellite time start at well under $100 per channel per hour — compared with commercial satellite rates several times that. To gain access to the public radio satellite, here's what you must do:

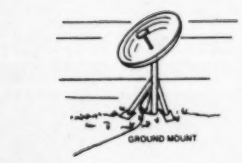
1) Contact NPR Distribution, 2025 M Street NW, Washington, D.C. 20036; 202/822-2000 or 800/235-

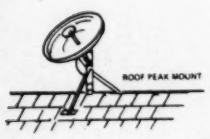
1212, and request their *Producer's Guide*. Read it thoroughly, twice. This is the basic primer for using the public radio satellite. It won't tell you how to be successful, or what types of programs to produce, or when to feed them. But it *will* tell you how to book time, what services NPR Distribution offers, where the uplinks are, what the current rates are, and so on. And it's *free*.

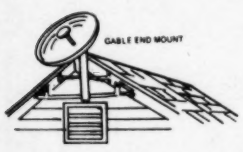
2) Sign and return the "Distribution Agreement" (enclosed with the *Guide*) along with the $25 registration fee. So long as you use the satellite at least once a year, you need not pay this fee again. Congratulations! You are now a Registered Source authorized to request satellite time.

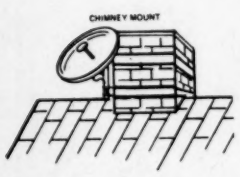
3) "Indemnify thyself." Actually indemnify NPR. The Distribution Agreement requires you to indemnify NPR and the system against any possible litigation that may arise from distribution and broadcast of your programming. You can purchase indemnification insurance from NPR for the nominal fee of $11 per program hour, which fee is added to your satellite bill; or you can purchase coverage on your own. This, too, is spelled out in the *Guide*.

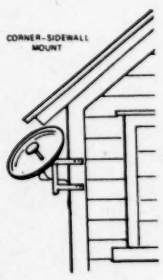
4) Book some time. Your journey has just begun. ■

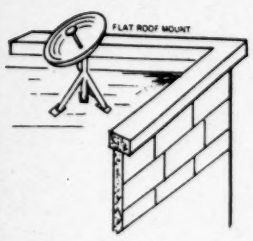








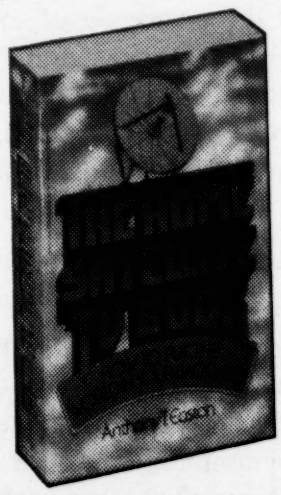




The Home Satellite TV Book

Once your big ear is up and listening, read this to delve deeper into the roaring satellite waters. Besides suggesting more ways to use TV dishes, it's got the poop on perfecting your earth station reception, hooking up a minicable TV system, and starting your own dish dealership (yes, that's how they multiply so fast). —KK

The Home Satellite TV Book
Anthony T. Easton
1982; 381 pp.
$10.95
($12.45 postpaid) from:
The Putnam Publishing Group
200 Madison Avenue
New York, NY 10016
or Whole Earth Access

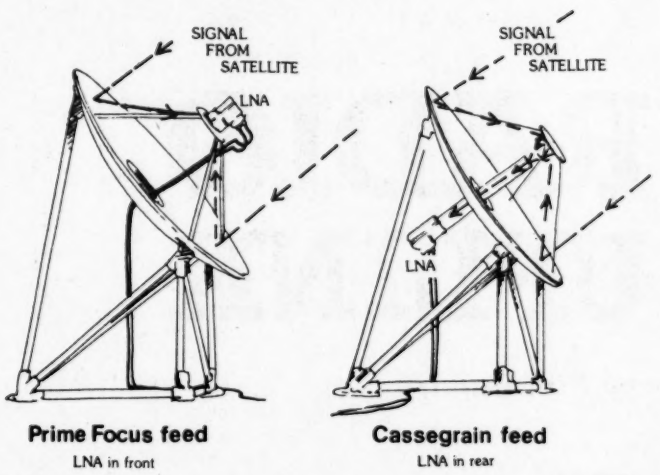


Home Satellite TV

There's more of a sense of honest revolution here than in the other dozen home-satellite periodicals in print. Sign up and get involved with grassroots crankiness about kidnapping commercial satellites and hands-on inventiveness that pushes the limits of backyard dishes. —*Kevin Kelly*

•

If HBO and the other cable programmers keep up this insane plan to scramble their signals, wouldn't it be possible to "scramble the scrambling" by transmitting an interfering signal to the satellite from a backyard dish??? The answer of course is "Yes, that could be done." And in fact, last spring somebody did just that for more than 10 hours' time on a Movie Channel feed.



Prime Focus feed
LNA in front

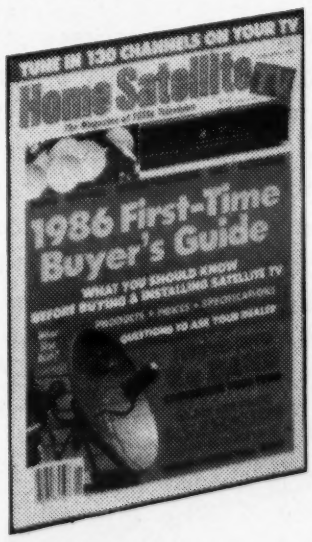
Cassegrain feed
LNA in rear

A satellite sits out there defenseless. All it takes is a transmitter and an antenna to send signals to a satellite. And in most situations, the satellite will send back whatever signals it receives. *Automatically.* If somebody turned on a transmitter designed to interfere with the HBO uplink signal on Galaxy I, not only would that interference wipe out HBO, it would destroy the HBO scrambling system as well. . . .

What's to prevent Cuba from simply pointing their uplink at an American satellite, such as Galaxy, and turning it on? Wouldn't that wipe out HBO or Showtime service? Of course it would. The White House backed "Radio Marti" broadcasts, commissioned earlier this year in the Florida Keys and designed to "educate" the Cuban masses, has already drawn a threat from Cuba's Castro to "fight back by blocking U.S. airwaves." Hey, *he is already equipped to fight the ultimate battle!* He could block our satellite transmissions with no more than 30 minutes of preparation time. And that concerns me.

A tiny 2½-foot Ku band antenna peers through a plate glass window and just over Manhattan's Chrysler building to see football from across the country. The owner switched to the Ku band system when his apartment house demanded a $100 million insurance policy to allow a C-band dish on the roof.

Home Satellite
(The Magazine of Total Television)
Bob Wollnik, Editor
$12/year
(six issues) from:
Miller Magazines
2660 East Main Street
Ventura, CA 93003



PACKET RADIO

bypassing the phone companies

by Benn Kobb, KC5CW, and Howard Goldstein

PACKET radio is a technique for distributing electronic mail and messages to specific terminals using radio channels. Its significance is that it offers computer users complete bypass of the wired telephone network and their high costs. You can therefore communicate long distances, dependably, without technical knowledge, for free.

The basic elements of a packet station are a cheap computer, a small radio transceiver, and a "terminal node controller (TNC)," the packet equivalent of a modem. A $200 hand-held radio and a $100 Commodore 64 computer work as well as anything.

The distance range of packet radio is around eight miles line-of-sight on open terrain, with an antenna up 30 feet and about 10 watts of power. Devices called digital repeaters (digipeaters) can extend the range of any station by retransmitting the packets. There's a protocol that lets you string up to eight of these digipeater hops together to reach another person. Plus, every TNC including your own is also a potential digipeater (you don't notice if someone "uses you").

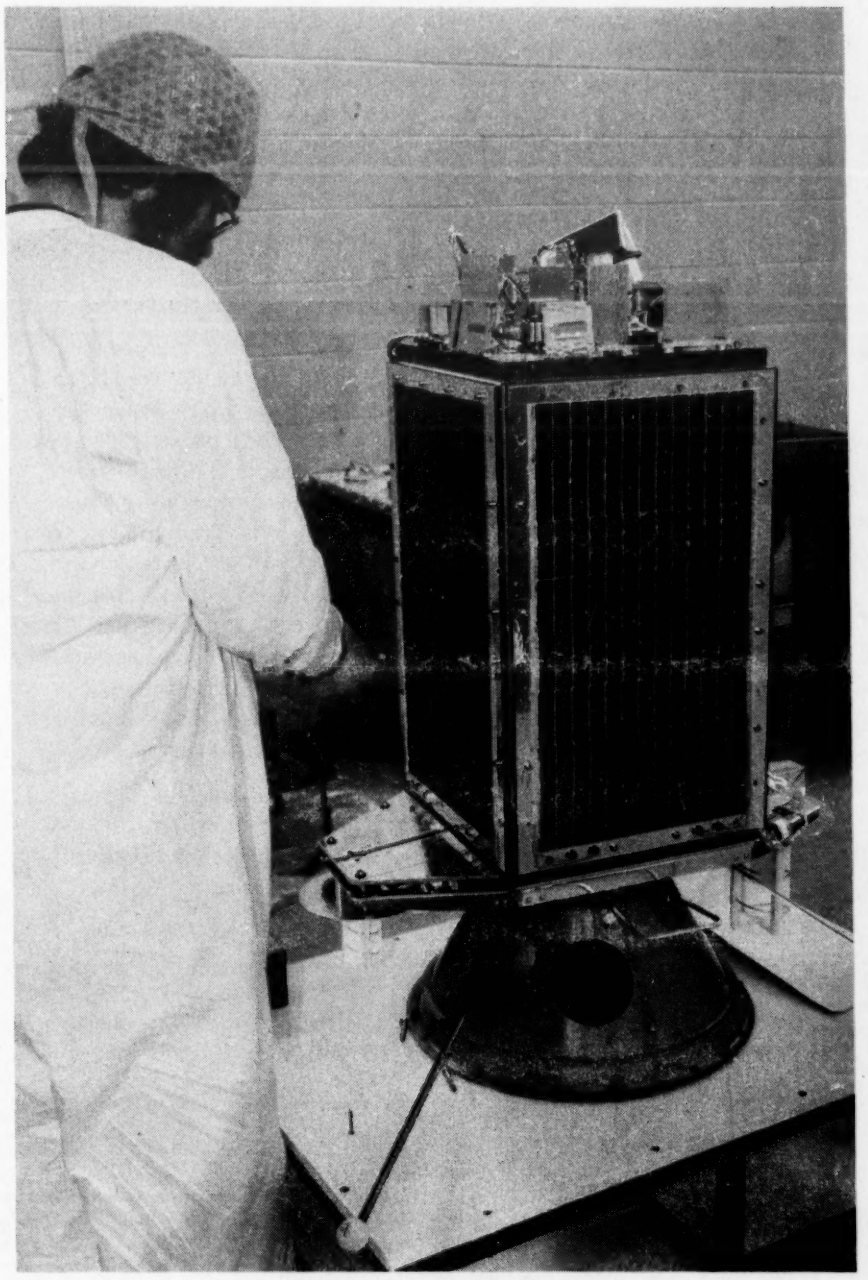
Many local and regional ham groups operate digipeaters, collecting dues from their members for upkeep; some are designated "gateways" to local or wide-area networks, or to long-distance paths via satellite or shortwave. Amateur packet nets are already so tangled that messages between any two points can be routed over many possible paths.

Radio amateurs have been quick to grasp the potential of packet, as it offers a much faster and more efficient way to handle messages than anything they had previously. It's also better suited to an urban environment than shortwave voice communication, the traditional mainstay of amateur traffic distribution. In cities, very little power and antennas that are just inches long are enough to get a packet signal to the next node in the network.

The future of packet radio lies in the heavens, on satellites. The first to be launched is PACSAT, a joint project between radio amateur groups AMSAT in Washington, D.C., and VITA, a 25-year-old organization that provides technical assistance to Third World countries. The idea is to set up an orbiting public mailbox. The satellite's orbit will bring it in view of any point in the world four times a day for several minutes at a time. During each pass it will dump whatever messages it has to packet radio listeners and pick up any new messages and hold them until it can post them. Japanese amateurs are also launching a similar low-orbit computer mailbox called JAS-1. Both are inexpensive devices built by volunteers and donations.

The ground equipment needed to get satellite mail fits into a briefcase — including the antenna. It runs on batteries. The initial cost is estimated at $1000. However, to use packet radio (via digipeaters or satellites), you need to have a ham license, and your messages cannot be for commercial use.

PACSAT



A low-cost digital communications device designed and built by amateur radio enthusiasts in the U.S. and Canada. Designated UoSat-OSCAR-11, it was launched into orbit in March, 1984.

This vast, decentralized, user-owned mesh of amateur packet stations and "birds" is not likely to be equalled by any commercial system. Its infrastructure is based on equipment people can afford and use in their spare time. Its popular base is its strength. Its reach is limited only by the imagination.

Gateway

To hook into the packet radio network we suggest you read *Gateway* (Ed Raso, Editor; $9/year [25 issues] from ARRL, 225 Main Street, Newington, CT 06111), a newsletter published by the American Radio Relay League (ARRL). If a "packeteer" could only get one magazine this is the one, and it's not overly technical. The latest issue reports a proposal to demonstrate packet radio during a space shuttle mission (flight 61-E). Dr. Ron Parise, WA4SIR, would take a lap-top computer, a hand-held radio, and a TNC up into orbit for a series of experiments, including electronic mail distribution on a global scale.

Also available from the ARRL is *The 1985 Handbook for the Radio Amateur*, an annual publication reviewed in NWEC p. 523. (*1985 Handbook for the Radio Amateur*, Mark Wilson, editor, 1985; 1184 pp.; $18 [$20.50 postpaid] from ARRL, 225 Main St., Newington, CT 06111.) It now sports nine pages of packet history, applications, technical detail, and some access to manufacturers of kit and prebuilt hardware, a short bibliography, and clubs and their newsletters.

CompuServe's HamNet SIG (GO HOM-11) has a section and data library devoted to packet, with

27 GATE FIVE ROAD SAUSALITO CA 94965

at least one introductory on-line document on the subject, and an on-line version of *Gateway* edited by ARRL, that reports significant, fast-breaking news and announcements every two weeks.

TNC Kit

Heathkit sells a TNC kit (Model HD 4040) similar to the TNC kit originally manufactured by the Tucson Amateur Packet Radio Corp. (TAPR) in Tucson, Arizona. The TAPR kit was the first reliable kit. I use one. It's not difficult to install or use; it has three main new commands and a clearly written manual. But TAPR has since licensed production of the kit to six other firms. (The Heathkit TNC, Model HD 4040, $249.95; catalog free, from Heath Company, Benton Harbor, MI 49022).

PACSAT

On the horizon is the dedicated packet radio satellite, PACSAT. Essentially a low-orbiting, store-and-forward "mailbox in the sky," PACSAT will work something like a courier service that arrives at least twice a day bringing new messages and taking any outgoing ones on the way out. Information about PACSAT is available from: AMSAT, P. O. Box 27, Washington, D.C. 20044.

Regional Newsletters

The other good sources for packet information are regional newsletters, which are usually tied to a local packet radio users' group. Join the organization that's working in your interest area (once you discover, during your first several months, what that is). For example, the New England Packet Radio Association (NEPRA) concentrates on traffic handling and host operation, and people interested in that should check them out.

The Florida Amateur Digital Communications Association (FADCA) publishes a regional newsletter called the *FADCA BEACON* (Gwyn Reedy, editor; information from FADCA, 812 Childers Lp., Brandon, FL 33511) which has a few introductory sheets on packet radio for a self-addressed, stamped evelope. This newsletter also includes operating news and technical stuff. Of the regional newsletters, the *FADCA BEACON* tries the hardest to come up with a mix of introductory, technical, and operating articles.

Other prominent regional newsletters are:

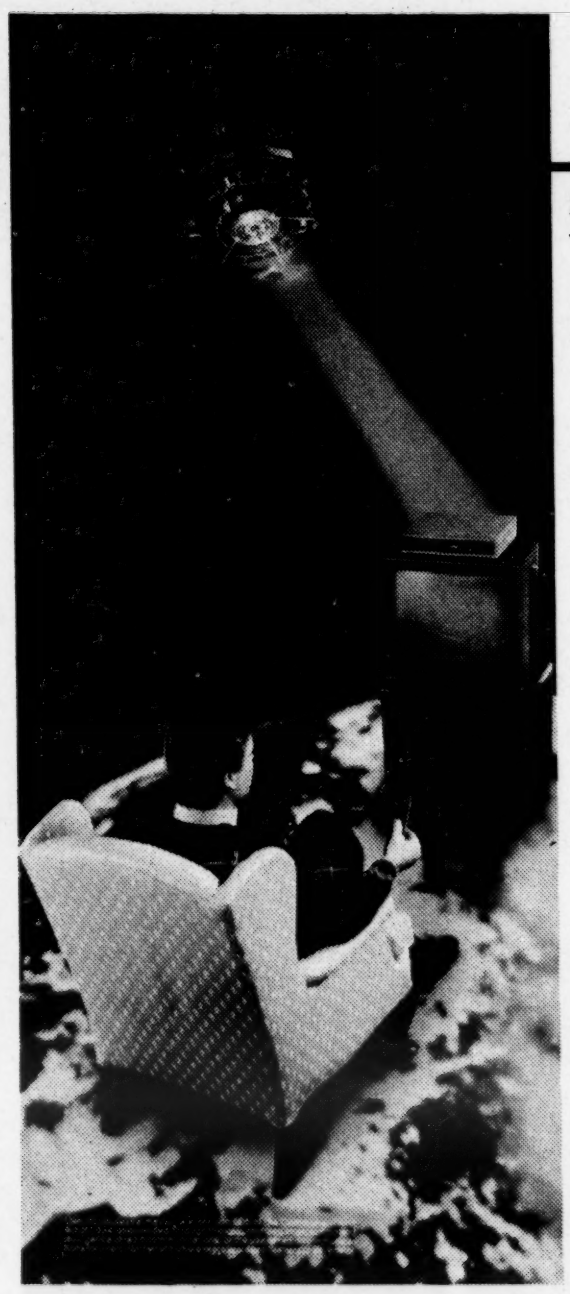
AMRAD Newsletter. This newsletter tries to satisfy a national audience besides strictly packet-oriented readers. It also experiments with spread spectrum techniques and handicapped applications.

DATACOM, available from British Amateur Radio Teleprinter Group, John Beedie, 161 Tudor Rd., Hayes, Middlesex, UB3 2QG England.

NEPRA PacketEar, avialable from New England Packet Radio Association, P. O. Box 15, Bedford, MA 01730. NEPRA members have developed an electronic "mailbox" (very similar to a computerized bulletin board system) with automatic relaying of messages from mailbox to mailbox, somewhat like FIDOnet in the way it transfers. The WORLI Mailbox is becoming the prevalent electronic bulletin board system on packet due to this transfer capability (and "freeware" status). It could be easier to learn and more flexible to use. Rumor has it NEPRA is working on a pipeline link from Boston to western Massachusetts. Developments in this system should find their way into the *PacketEar*.

Public Digital Radio

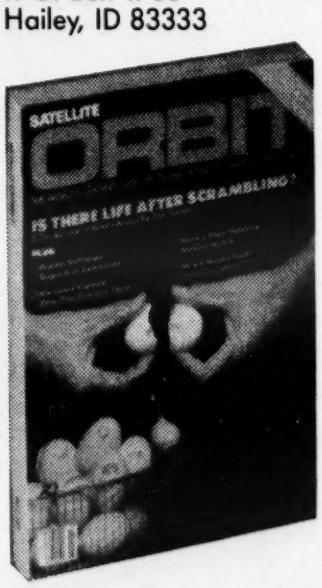
This past October, Donald Stoner, W6TNS, filed a petition with the FCC asking them to set aside 2 MHz of spectrum for a Public Digital Radio Service that would "allow computer owners to exchange messages, bulletins, computer programs and other information by radio, and at no cost." Very similar to the wireless packet nets being spun by hams, it would bypass the phone system, be toll free, and capable of supporting both fixed and mobile communication. For details contact Stoner at CompuServe 70371,111 or in care of the Microperipheral Corp., 2565 152nd Ave., NE, Redmond, WA 98052. ■

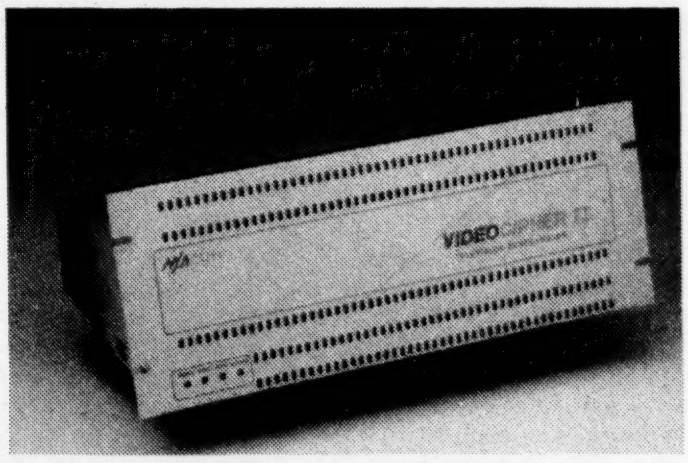


Satellite ORBIT

The thickest, slickest and most commercially ambitious of the satellite TV magazines. Full coverage of the three-year-old industry — programs, services, hardware, and technical politics. —Robert Horvitz

Satellite ORBIT
Bruce Kinnaird,
Executive Editor
$48/year
(12 issues) from:
Satellite Orbit
P. O. Box 1700
Hailey, ID 83333





The consumer version of this commercial VideoCypher II decoder will cost less than $500.

•

The M/A-Com scrambling system is based upon encryption techniques used by the supersecret National Security Agency and industry experts claim it will be uncrackable. For consumers, the signal sent from the satellite will be descrambled by a home version of M/A-Com's commercial VideoCypher II decoder that will descramble the same signal for cable operators. The decoder also will allow consumers who subscribe to a scrambled service to view special events on a one-time, pay-per-view basis.

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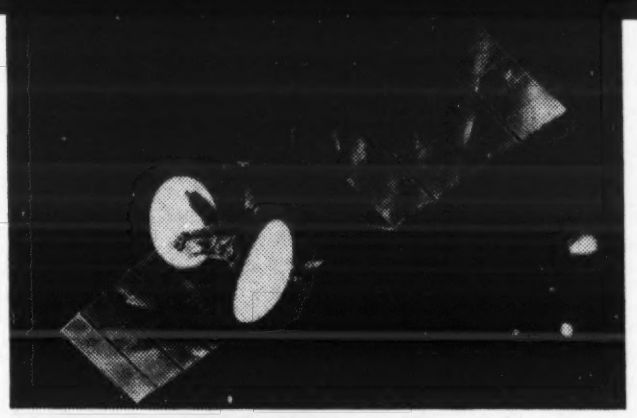
Hidden among the 100-plus video channels on your dish are some 40 audio programs — many of them stereophonic, and most offering programming not available outside major metropolitan areas. . . .



TV Direct Broadcast Satellite

Communication Satellites

An excellent reference for monitoring the communication systems of all kinds of satellites, including maritime, amateur radio, weather, navigation, and remote sensing. With the proper equipment and current orbital data, listening in on many of these "birds" is not a difficult, megabuck project. Some transmissions can be tuned in with a conventional VHF-band scanner.

Van Horn describes the communication-system architecture of dozens of satellites, gives their operating frequencies, and tells how they're used. He's particularly good on the Soviet space programs, U.S. military systems, both sides' reconnaissance and surveillance platforms, and the space shuttle.

Written with the space junkie/radio hobbyist in mind, this is a directory, not a how-to manual. A beginner needs additional information about antennas, receivers, orbital mechanics and monitoring techniques. ***The Satellite Experimenter's Handbook*** *(WER #46, p. 26) covers all that brilliantly. However, Van Horn does discuss capturing weather satellite data and Soviet television.*

—Mike Peyton

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Weather Satellite Handbook, R. E. Taggart, 1981; now out of print. This is an excellent book for the weather satellite monitor. No self-respecting weather buff should be without one — if he can find it!

Worldview, Raul J. Alverez, 2512 Arch Street, Tampa, FL 33607. Quarterly newsletter for the environmental satellite user. Excellent for the beginner and old pro as well.

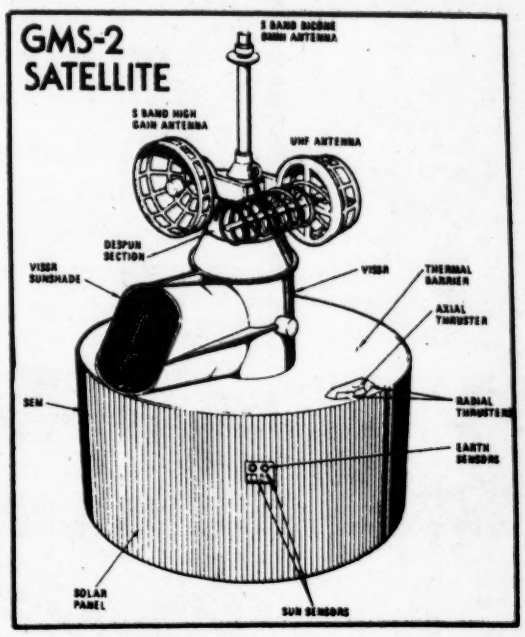
Communications Satellites
Larry Van Horn
1985; 216 pp.
$14.45
postpaid from:
Grove Enterprises, Inc.
P. O. Box 98
Brasstown, NC 28902
or Whole Earth Access

AMSAT, P. O. Box 27, Washington, DC 20044. Membership is open to amateurs and non-amateurs alike. If you want to keep current on amateur satellites this is the place to be. Their publication — AMSAT Satellite Journal — is included with membership.

•

Lauren Paine in his book, *The Technology of Espionage* claimed that these IMEWS satellites included a large amount of SIGINT equipment. 'It could pick up, record, and transmit emanations from all land communications systems, including radio and microwave telephonic transmissions. It was also rigged with other varieties of electronic surveillance equipment which were sensitive enough to do the work of hundreds of secret listening posts the United States intelligence community had in such places as Turkey, Iran, and West Germany. It was capable of duplicating everything those listening posts could do.'

Information on hand at this time indicates that at least one of the IMEWS satellite's frequencies is centered around 250 MHz.



The Hidden Signals on Satellite TV

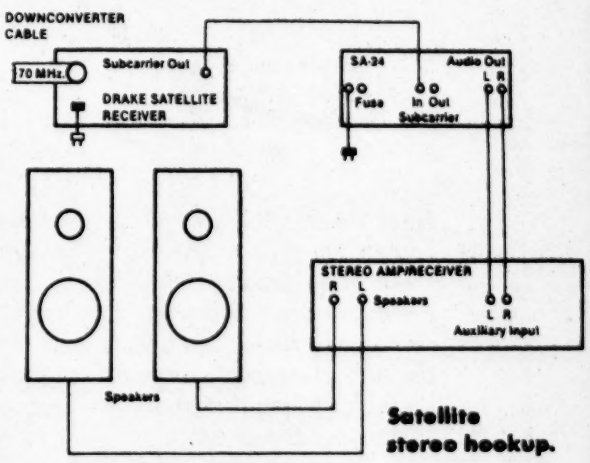
With more satellite-relayed TV programs being scrambled, backyard satellite dish promoters are starting to publicize the fact that your dish enables you to monitor other types of satellite-relayed signals, too. This book tells most of what you need to know to monitor long-distance phone calls, news agency teletype, stock and commodity prices, corporate data communications, audio services, etc. I'm not recommending you use your satellite dish that way; the importance of this book is in showing that it's relatively easy to do, using off-the-shelf equipment.

The book has lots of pictures and charts, but is badly copy-edited with many typos. Spelling errors can be seen and discounted at a glance; numerical typos are much harder to pick out, and this book has a lot of numbers. I'd be leery of taking them as gospel, but it's the descriptive passages that really matter, and there is no more explicit and detailed how-to manual currently available.

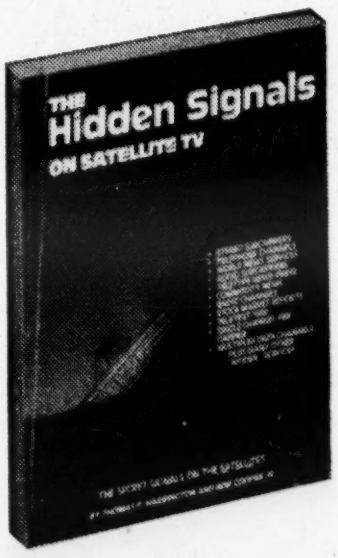
—Robert Horvitz

•

On some pure data and telephone transponders (non-video), you may hear something that sounds like a buzz saw, or something that sounds like musical chimes, or you may hear a telephone circuit ringing or a busy signal. On the active telephone channels, you will hear telephone conversations, some radio feeds, communications circuits between the satellite control operators, hotel and motel reservation sections, auto rental companies; at any given moment you could find between 600 to 1200 separate carriers in place!

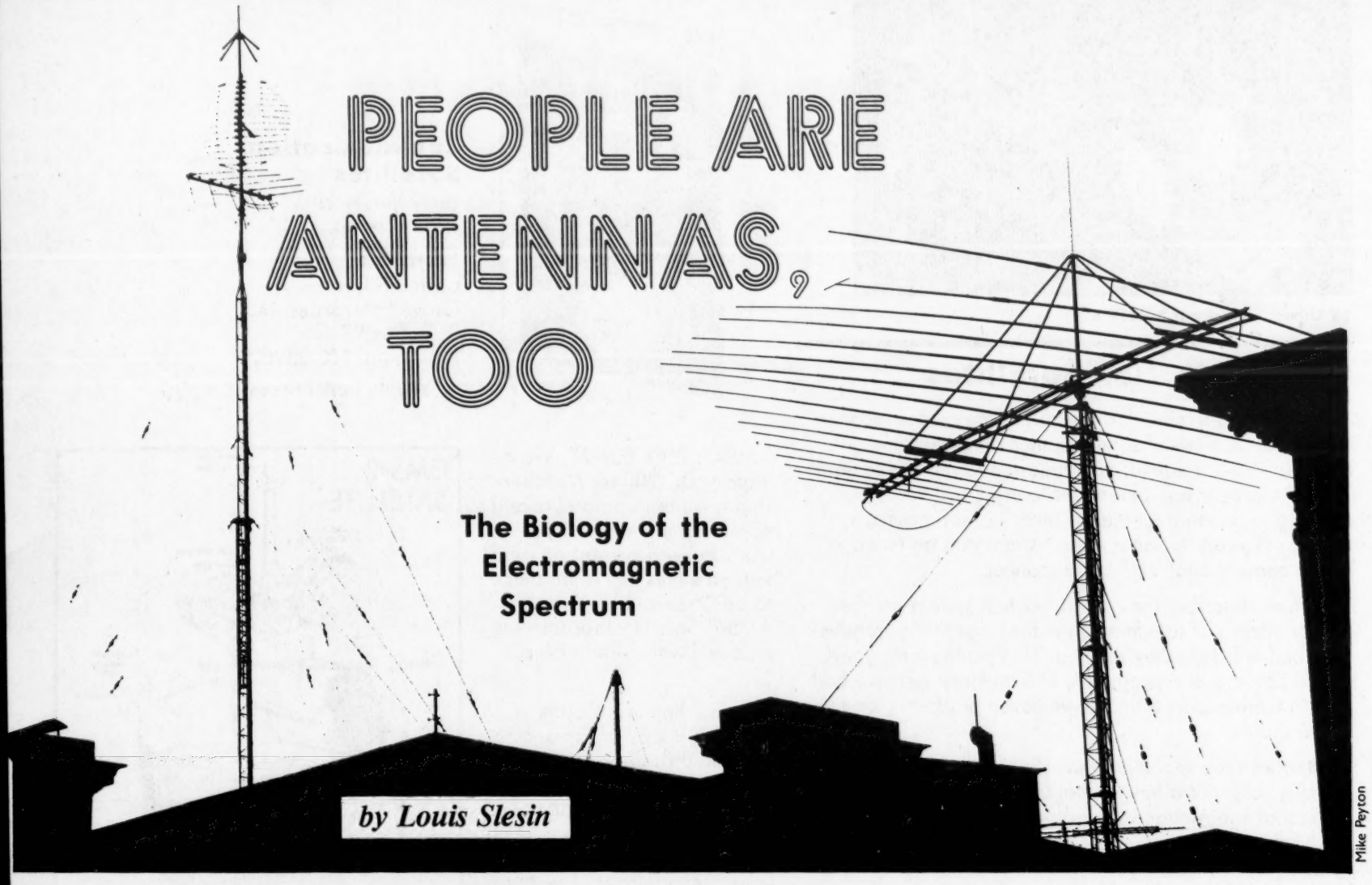


Satellite stereo hookup.



The Hidden Signals on Satellite TV
Thomas P. Harrington and Bob Cooper, Jr.
1984; 179 pp.
$14.95
($16.70 postpaid) from:
Universal Electronics, Inc.
4555 Groves Road,
Suite 3
Columbus, OH 43232

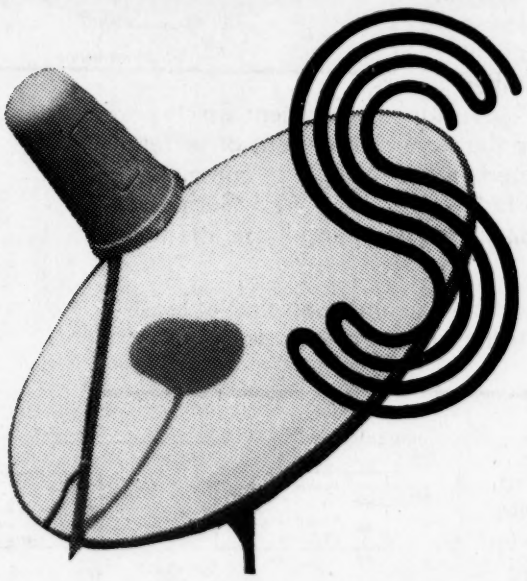
PEOPLE ARE ANTENNAS, TOO



The Biology of the Electromagnetic Spectrum

by Louis Slesin

Mike Peyton



SATELLITE DISHES, radio and television antennas, radar and power lines fill the air with non-ionizing radiation, and people are becoming increasingly concerned about the possible health risks. Experts have tried to quell the fears with pronouncements that there is nothing to worry about. Non-ionizing radiation is safe, they tell town meetings. But not everyone has been convinced or dissuaded by accusations of "radiation-phobia."

The reason is simple. We know practically nothing about the effects of long-term, low-level exposure to non-ionizing radiation. Though the number of studies seems impressive, most are crude, many are contradictory, and some of the results and the way they were handled are anything but reassuring.

Sources and Waveforms

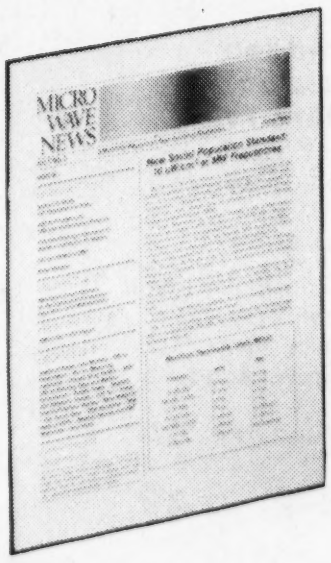
The skylines of our cities and the hills of the countryside are dotted with radiation sources. The public remains blissfully ignorant of the millions of antennas and transmitters that surround them — until someone tries to put one in their backyard.

A few statistics. The Federal Communications Commission (FCC) has authorized a huge number of transmitters, including more than 1,500 television and 10,000 radio stations and millions of land-mobile and citizen-band (CB) radios. New sources of radiation are activated every day with the dramatic growth of the communications industry: satellite stations, low-power television stations, cellular phones and paging systems.

Current estimates show that nearly nine million workers are exposed to radiation on the job in applications ranging from binding plastics to cooking potato chips. The military has hundreds of thousands of transmitters of its own, everything from high-power radars to electronic warfare systems to hand-held walkie talkies.

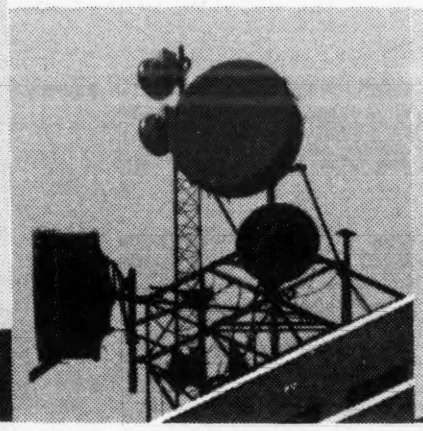
High voltage transmission lines are strung across the country. Tens of thousands of miles of power lines now deliver electricity from generating stations to user communities, and in the consumer

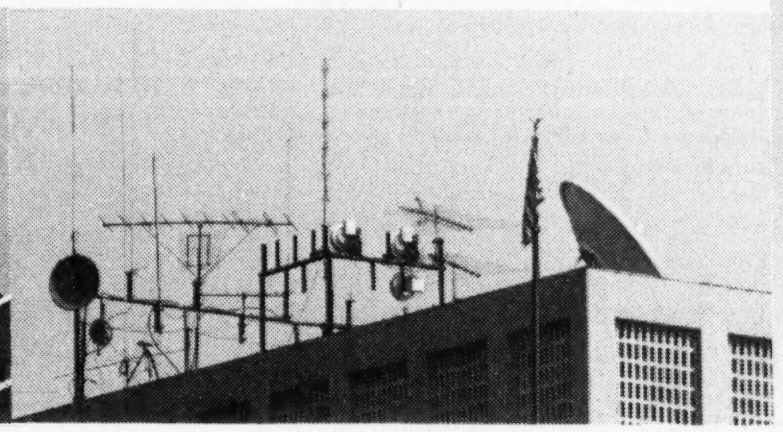
Louis Slesin is the editor and publisher of the somewhat-misleadingly-named ***Microwave News****. This covers not just microwave, but the entire radio spectrum, focusing on research into biological effects, with scientific depth and criticality unequaled by any other journal walking this beat. The best source of RF bio news around.* —*R. Horvitz*

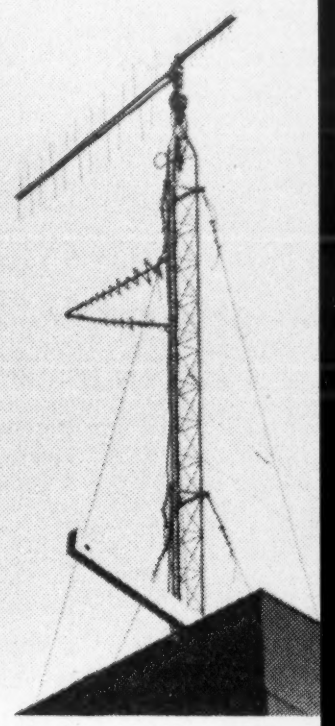


Microwave News
$200/year
(10 issues)
from:
P. O. Box 1799
Grand Central Station
New York,
NY 10163

Our bodies perceive the constant vibration of invisible phone conversations, radio talk shows and TV commercials that percolate though our cells every hour.







(Facing page) the roof of the Soviet Embassy in Washington, D.C. (Above) rooftop radiation gear in downtown Washington.

market, sales of microwave ovens are skyrocketing, sometimes exceeding a million units a month. Cordless phones and security devices are the latest rage.

The simplest way to make sense of all these applications is to separate them into those that use the radiation to transfer information and those that use its intrinsic energy. The words and pictures of radio and television are carried on the radiation, while microwave ovens and transmission lines deliver power. (The most ambitious plan to harness microwaves was a proposal, now shelved, to collect solar energy and beam it down to huge collecting antennas on the Earth's surface.) Radar signatures can be decoded to yield impressively detailed descriptions of flying objects, while diathermy machines generate heat for therapeutic treatments.

Modern electronics and communications technology is based on the art of "modulating" radiation so that it can carry information — for example, amplitude modulation and frequency modulation give us AM and FM radio. Radar is made possible by pulse modulation, that is, turning the radiation source on and off at fixed intervals. By manipulating the radiation, engineers can create an infinite number of different signals or waveforms, each designed to serve a particular purpose.

Ionizing vs. Non-ionizing Radiation

Most people think of radiation as meaning simply ionizing radiation, never considering visible light as radiation. It is convenient, though an oversimplification, to split the radiation spectrum into two parts, with visible light as the dividing line between the ionizing and non-ionizing varieties.

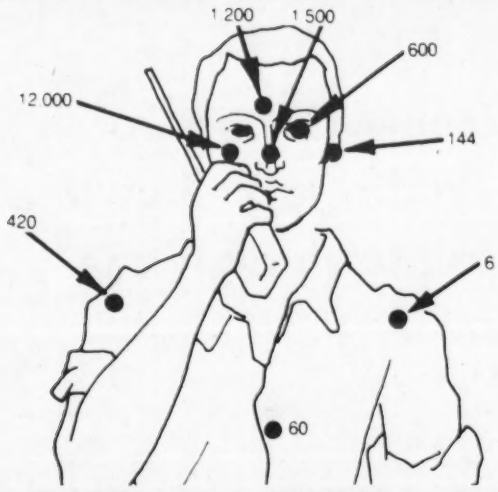
One crucial variable is the frequency of the radiation, which determines its energy content. Don't confuse this with intensity. The difference is between "what kind" and "how much." Ionizing means that the radiation has enough energy to strip electrons off atoms or molecules creating charged particles, called ions, which can then initiate biochemical reactions. Overexposure to ionizing radiation is known to cause cancer and numerous afflictions. Many experts have long believed that non-ionizing radiation can only heat body tissues. Those who favor this view, a group I shall call the "thermalists," argue that as long as the amount of energy absorbed by the human body is less than that required to cause heat stress, there is no reason to worry about exposure to non-ionizing radiation.

Short of ionization, radiation *can* induce changes in the energetics of biomolecules. Indeed the human eye is the best and the most extraordinary example of the power of non-ionizing radiation. The eye can interpret minuscule quantities of light to provide us with startlingly detailed, three-dimensional color images.

Microwaves and lower frequency radiation cannot ionize a molecule, but they can cause molecules to vibrate or rotate, and the energy is then dissipated into heat; microwave ovens, for example, cook by vibrating water molecules. The degree of heating depends on the frequency of the radiation and the type of material being irradiated.

Thermal Standards

The thermalists firmly control the standards set to protect workers and the general public. Most exposure limits are based on the amount of radiation absorbed by the human body — the specific absorption rate (SAR) — and the resulting potential for heating. The SAR concept is a useful way



Microwave exposure from a walkie-talkie (in microwatts per square centimeter).

The Body Electric

to take into account the fact that humans and animals act as antennas and absorb the most energy when their size is approximately half the wavelength of the radiation. Thus, a man who is 2 meters in height has a maximum SAR for a given amount of radiation which has a wavelength of 4 meters — about 75 MHz. Small children will absorb more energy at higher frequencies.

Over the last few years, health standards have been revised to take SARs into account, with the result that the most restrictive standards are in the 30-300 MHz frequency range, used for FM radio and television broadcasting, among many other applications.

But SARs skirt the pivotal question: Whether the radiation's electric and magnetic fields can cause biochemical or physical effects beyond heating. This is still relatively uncharted scientific territory, but a consensus is building that such interactions *do* occur. Proponents of this view, the "non-thermalists," point to a number of experimentally verified interactions that cannot be explained by heating.

Conceptually, the possibility that electric and magnetic fields can affect us makes a lot of sense. After all, we are electrical creatures who live in a magnetic field — the Earth's. Some combination of external fields could likely upset the body's delicate balance (much like certain drugs can have toxic repercussions). The recent episode of Humphrey "the wrong-way whale" that swam up the Sacramento River illustrates the point. News reports indicate that every time the whale swam under a bridge carrying a power line, it lost its sense of direction and began to swim in circles. The weakness in the non-thermalists' position is the lack of a robust theoretical model to explain how low levels of radiation can interact with living cells.

Just as we split the uses of non-ionizing radiation into those based on its energy and information content, we can apply the same model to the dispute between the thermalists and the non-thermalists. On one hand, the radiation's energy can cause heating, while, on the other hand, its information content may be extracted to catalyze specific biochemical reactions.

Though we cannot yet explain how our bodies might interpret selected signals, the reason may simply be that we haven't developed the necessary tools to observe the interaction. For instance, we are all bathed in broadcast signals. If we were to measure the radiation levels from these signals, we would find them extremely low and would discount their potential for heating. But with the right electronic equipment (a television or a radio), we can decode (or demodulate) the signals, and suddenly we see and hear a hidden world of sights and sounds. I am not implying that broadcast radiation is affecting us, but we now have no way of knowing if it is.

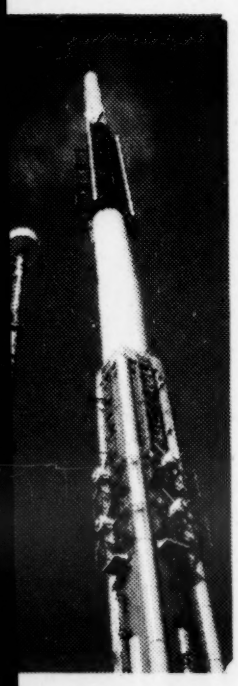
In the early 1970s, Dr. Ross Adey, now at the Veteran's Administration in Loma Linda, California, led a team that discovered the first frequency-dependent effect: The ability of 16 Hertz (Hz) radiation to alter the flow of calcium ions in the brain. (This occurs at such low power levels as to preclude a thermal explanation.) Dr. Carl Blackman at the Environmental Protection Agency later replicated and extended Adey's work. Together their data show that *specific* combinations of frequencies and intensities of extremely low frequency (ELF) radiation can upset the brain's calcium balance.

Others have found frequency-specific effects. Dan Lyle, a graduate student working with Adey, discovered that 60 Hz modulated 450 MHz radiation can alter the immune system. Drs. Richard Dixey and Glen Rein, working in London, England, have shown that 500 Hz pulsed magnetic fields can affect neurotransmitters.

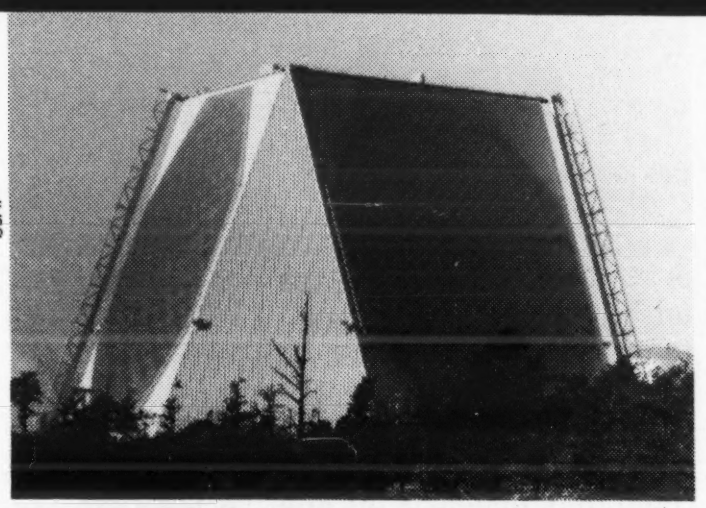
In the jargon of the business, such frequency and intensity combinations are known as "windows" because small changes in either variable will eliminate the observable effect. The windows imply a complex biological interaction, leaving us without the familiar techniques for assessing hazard. Dose response curves (for instance, double the dose, double the effect) may therefore be irrelevant for risk assessment.

There are other surprises. Recent experiments by Blackman and others show that the Earth's magnetic field could be a decisive variable in the ability of non-ionizing radiation to affect biological systems. Our natural magnetic field is by no means constant; it changes from place to place and from time to time. Researchers are only now learning they must take this variable into account in their experiments.

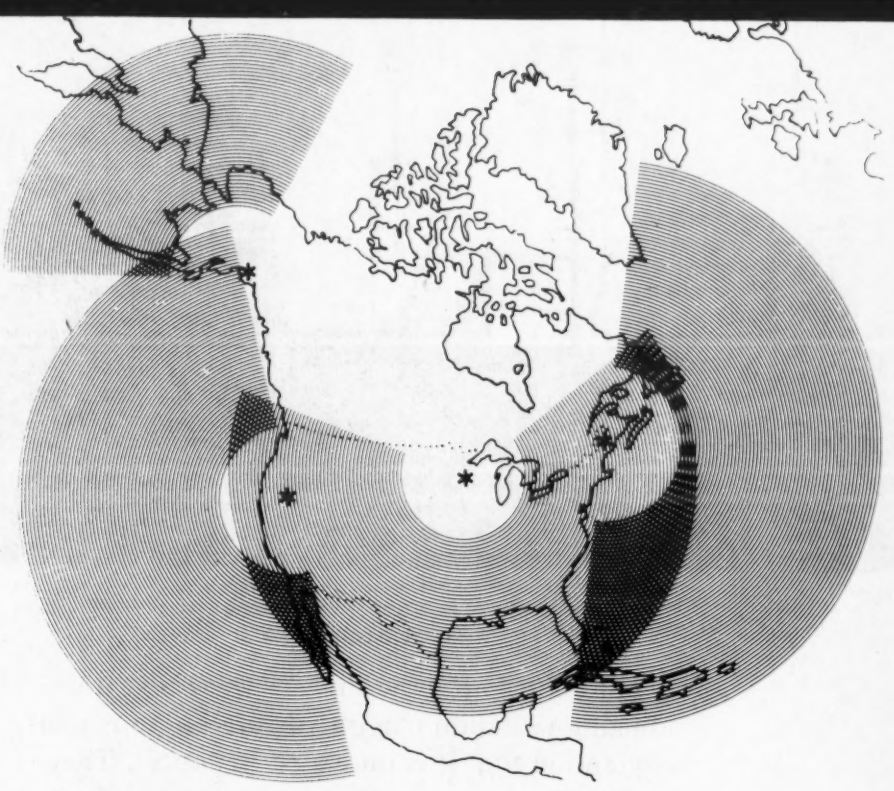
Dr. Adey and Dr. Craig Buys of the University of California at Riverside hypothesize that *intermittent* exposures to electromagnetic fields may be more detrimental than constant exposures — another blow against the dose-response paradigm.



Antenna mast atop the World Trade Center, New York.



USAF



ANARC OTH Radar Committee

The PAVE PAWS radar at Otis Air Force Base, Cape Cod, Massachusetts, part of a network of over-the-horizon radars now under construction to detect aircraft approaching North America. The midwestern sector, one of four, would be built of transmitters similar to PAVE PAWS. In operation, the sector would cover most of the continental U.S. with up to 4,800,000 watts of shortwave radiation, 24 hours a day.

Although we can compensate for changes in the environment, each time we are forced to do so, our bodies are stressed. The greater the stress, the greater the long-term potential for harm.

Some non-thermalists have suggested that the radiation can cause a stress response. Beyond any frequency-specific effects, the radiation can weaken the immune system and cause long-term harm. If this turns out to be true, it would mean that diagnosing radiation-induced illness would be quite difficult because different people would manifest their symptoms differently — depending on a person's genetic predisposition.

In his new book, *The Body Electric: Electromagnetism and the Foundations of Life* (reviewed on p. 55), Dr. Robert Becker concludes: "ELF electromagnetic fields vibrating at about 30 to 100 Hertz, even if they're weaker than the Earth's field, interfere with the cues that keep our biological cycles properly timed; chronic stress and impaired disease result."

Beyond Continuous Radiation

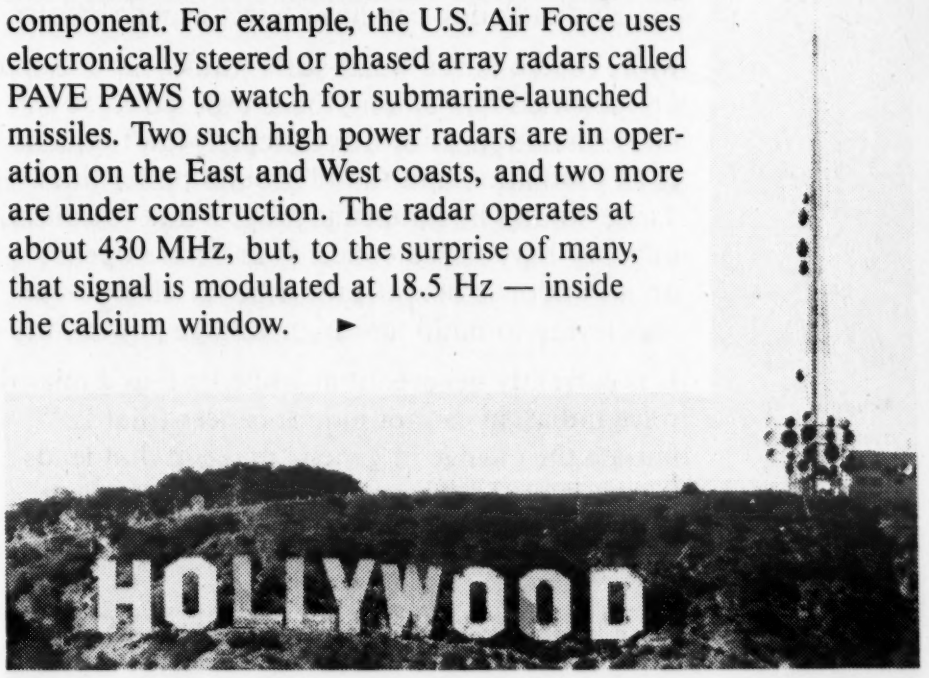
Most research on the biological effects of non-ionizing radiation has focused on the use of continuous wave, or unmodulated, signals — those, for the purposes of this discussion, that have no information content. This is unrealistic, however, for as Dr. Adey explained at a recent scientific meeting: "There is essentially no continuous wave radiation in domestic, industrial and military environments." Adey went on to say that continuous wave radiation "has no relevance to the real world."

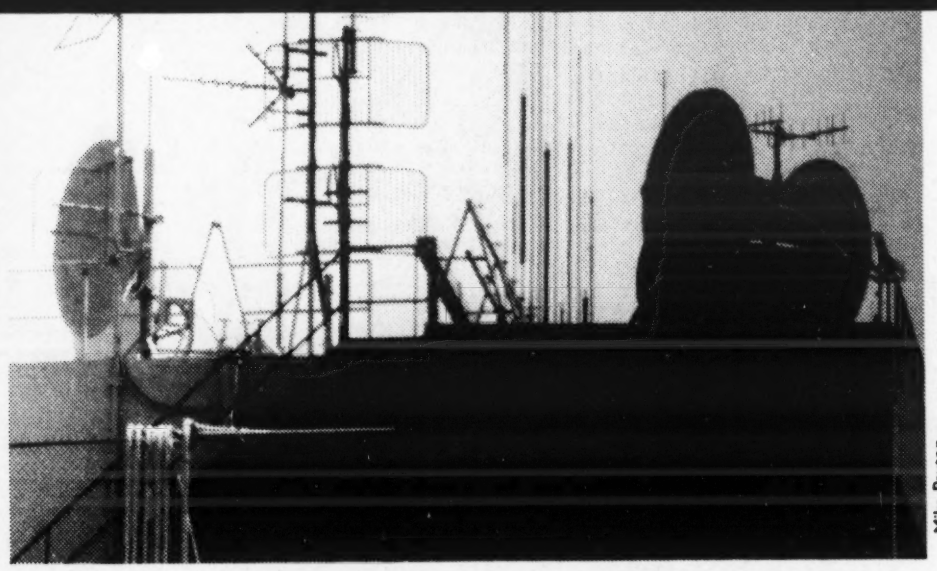
It is quite possible that different waveforms have different effects beyond their common potential for heating at high doses. If so, the problem of sorting out which signals are dangerous becomes awesome.

Consider the parallels to toxic chemicals. Each compound must be tested for each type of effect, leaving regulators reeling at the task of approving or controlling the more than 50,000 chemicals used in commerce — out of the more than four million different compounds catalogued to date. It is easy to see the attraction of limiting worries about radiation bioeffects to its heating potential and to disregard other types of effects.

At least one group of researchers firmly holds to the belief that different waveforms can have specific effects. Pulsed electromagnetic fields (PEMFs) are winning widespread medical applications. PEMFs are applied to heal fractures and, more recently, have been harnessed to regenerate nerves and to combat chronic pain. The theoretical basis for PEMF therapy is anything but clear, but it does not depend on heating.

However respectable the Adey-Blackman calcium findings have become, they are not taken seriously in the setting of exposure standards. As one federal agency recently concluded, the calcium work "has no known significance" to health. Is anyone exposed to 16 Hz radiation? Not directly, because no one uses this frequency. But other sources of radiation at much higher frequencies can be modulated at approximately 16 Hz, and our bodies can then demodulate the low frequency component. For example, the U.S. Air Force uses electronically steered or phased array radars called PAVE PAWS to watch for submarine-launched missiles. Two such high power radars are in operation on the East and West coasts, and two more are under construction. The radar operates at about 430 MHz, but, to the surprise of many, that signal is modulated at 18.5 Hz — inside the calcium window. ►





Mike Peyton

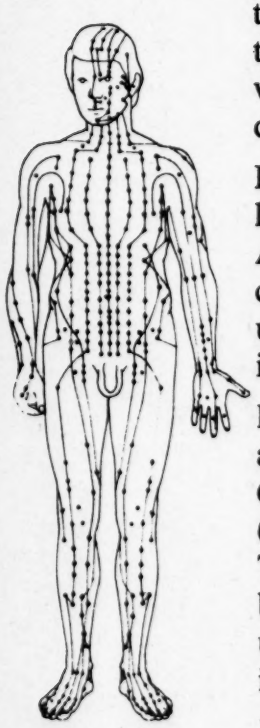
CBS newsgathering installation.

A Cancer Risk?

A corollary to the thermalists' view that non-ionizing radiation can only heat you up is their contention that it is unrelated to cancer. They argue that since the radiation cannot break chemical bonds, it cannot affect DNA and bring about the abnormal cellular development associated with cancer.

But last year an experimental study by Dr. Bill Guy at the University of Washington in Seattle indicated that cancer associated with non-ionizing radiation is a very real possibility. Guy reported that rats exposed to pulsed microwave radiation had a significant increase in the incidence of tumors compared to rats treated identically except for the radiation. The tumors were localized in the endocrine or glandular system.

In March of 1985, preliminary results of a large-scale epidemiological study showed an excess of cancers among Polish servicemen exposed to non-ionizing radiation. Two months later, a radar technician sued the Federal Aviation Administration, claiming the radiation he had been working with had caused him a fatal brain tumor. He died in July.



Acupuncture meridian lines.

Dr. Christopher Davis of the University of Maryland and Dr. Mays Swicord of the Food and Drug Administration (FDA) have shown that DNA can absorb microwaves. They have thus opened up the possibility, previously rejected, that non-ionizing radiation can have direct genetic effects.

More than a dozen small-scale studies have found an increased risk among those exposed to 50 or 60 Hz radiation, known as extremely low frequency (ELF) radiation and found around power lines. These studies by no means prove a link to cancer, but they have raised concerns and have opened up a Pandora's box of problems for electric utilities trying to build new high voltage power lines.

It is currently believed that while ELF and microwave radiation cannot induce cancer (that is, initiate the change in genetic makeup that leads to uncontrolled cell growth) both can *promote* the development of cancer once the cells have been made cancerous.

The Air Force, which paid for Dr. Guy's experiment, has no plans to repeat it to either confirm or refute the results. History is repeating itself, for in 1962, Dr. Charles Susskind and Susan Prausnitz at the University of California at Berkeley published a paper suggesting that pulsed microwaves could cause leukemia. As late as 1976, the FDA called this experiment "the most discomforting finding in the available literature." To this day, no attempt to replicate the Susskind-Prausnitz has been funded.

Furthermore, the Air Force has been publicizing its view that the results of Dr. Guy's study were negative, which contradicts many other opinions. The only way to challenge the Air Force's position would be to conduct a new study, but no other federal agency has earmarked enough money for such a study, nor have any funds been marked for large-scale epidemiological studies. Fortunately, some epidemiological studies are now exploring the ELF-cancer link.

The Need for Answers

A better understanding of the biological action of non-ionizing radiation will open up new fields of scientific inquiry. It is no exaggeration to predict that radiation will eventually provide us with new tools to study biochemical and neurological processes. Over time these tools could become as important as genetic engineering and the recombinant DNA technology that made it possible.

But at a time when science promises technological breakthroughs and citizens are demanding answers to questions about radiation risks, the Reagan Administration is cutting the meager funds that are available. Many agencies have had to stop working on radiation biology. At the end of 1985, one of the nation's premier research groups at the Environmental Protection Agency was closed down.

By refusing to address public anxieties about radiation risks, the government is hurting business as much as anyone else. Citizen groups and coalitions are forming across the country to stop the siting of communications installations. The costs of scrapping projects and delaying others will be greater than the funds needed to understand what types of levels of radiation exposure should be avoided.

More and more, the public is becoming convinced that government and industry have no interest in public health risks. Anyone who underestimates the power of angry citizens' groups has failed to learn the lessons of nuclear power, toxic chemicals and many other environmental disputes.

Non-ionizing radiation promises to provide us with untold applications, but we may never profit from them unless we resolve the question of potential health effects. ■

The Body Electric

This book is almost as annoying as it is astounding. Robert Becker is an orthopedic surgeon who spent most of his career studying bone-healing, tissue regeneration and the biological role of electromagnetic currents and fields. He wanted to find out how and why some animals could regenerate entire limbs and even vital organs and hoped that some of this resilience could be unlocked in the human body. Early on, he read reports from the Soviet Union about "currents of injury" — weak electrical flows in plants and animals that seemed to have something to do with tissue repair. In the West, bioelectricity was regarded as a subject unfit for serious research.

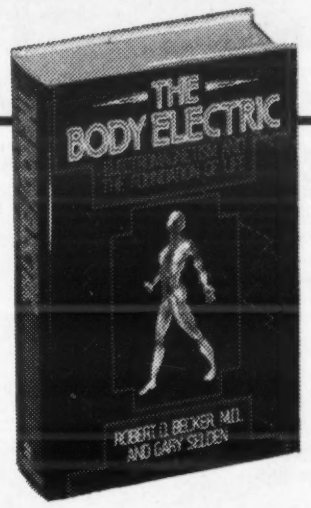
Becker's interest in the subject seemed quite subversive in the 1950s, and a subplot of this book is how the popularity or unpopularity of certain ideas affects the funding of medical research. To make a long story short, Becker's work produced many breakthroughs in our understanding of regeneration and led to the development of an implantable electrode charged solely by the electro-potential of the surrounding tissue that apparently accelerates bone-healing in humans. He also claims to have confirmed Albert Szent-Gyorgi's hunch that certain types of living tissue are semiconductors — in particular, peripheral nerves and bone. When tissues with different electronic properties meet in the salty fluid of the body, a sort of "diode" is formed. The body as a whole, says Becker, not just the nervous system, is an active circuit.

For medical people used to thinking of the body in chemical or mechanical terms, this is radical stuff. And the implications are more radical still: by analogy with solid-state semiconductors, where minute changes in the chemical structure of a chip drastically affect its electronic response, could minute chemical changes likewise alter the body's semiconduction? If, for example, we were immersed in an electromagnetic environment very different from the one in which our bodies evolved, might that not have subtle but significant repercussions on body chemistry?

When the book focuses on Becker's own research (as it does most of the time), it's quite detailed and convincing. In fact, it's a great detective story, as he probes the regenerative talents of salamanders, frogs and newts (when he cuts out half the heart of a newt, he discovers it can regrow the missing half in less than a day!). He's careful to qualify his results and to discuss anomalous and contradictory evidence when his findings are inconclusive.

The book is less cautious in citing research by others, especially in fields beyond Becker's own expertise. Many allusions are so sketchy that it's hard to judge whether the synopses are accurate, whether the methodology was sound, whether the same data might have other explanations. And there's no bibliography — no way to go back to the original reports. Since so much in this book strains credulity, the lack of specific citations is very frustrating, even irresponsible.

But the most irritating flaws come toward the end of the book, where speculation starts to crowd out science. The chapter on how lifeforms might sense and respond to the Earth's magnetic field is interesting but loaded with unproven suppositions. And the long chapter on the hazards of manmade electromagnetic fields has a number of inaccuracies. For example, he attributes an increase in heart attacks and cancer in a particular part of Finland to the microwave beam of an over-the-horizon radar in the USSR. Unfortunately, this radar operates in the short-wave, not microwave, band (that makes a big difference), and its beam is more intense across Sweden and Norway, where no similar effects are reported. There's a lot of alarming material in this chapter, especially regarding ELF pulses; it should have been reviewed more carefully by specialists.



The Body Electric
Robert O. Becker, M.D., and Gary Selden
1985; 364 pp.
$17.95
($18.95 postpaid) from:
William Morrow
and Company
105 Madison Avenue
New York, NY 10016
or Whole Earth Access

This is, as I say, an astounding, thought-provoking book. The fact that it was written for a lay audience is problematic: it presents extremely radical claims and ideas, with inadequate documentation, to people not equipped to judge their validity. It would be far more compelling if it didn't include so much speculation. However, there's nothing else like it in print, and its content is much too important to ignore. The vistas it opens should keep researchers busy for decades — if they're not put off by the popularized presentation. —*Robert Horvitz*

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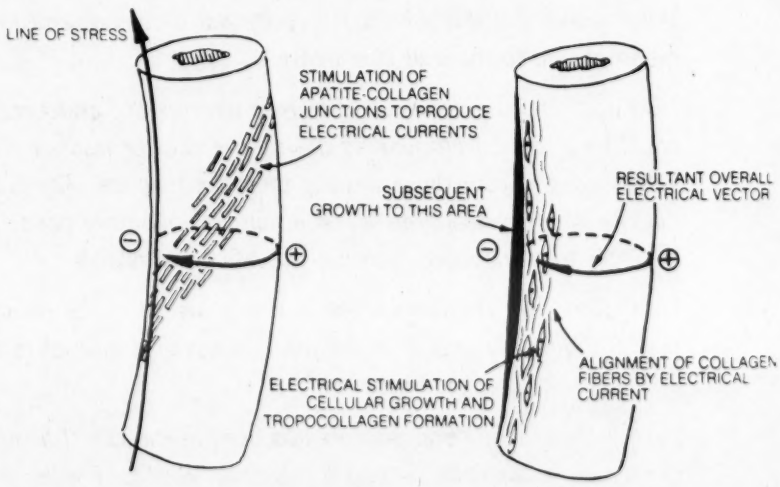
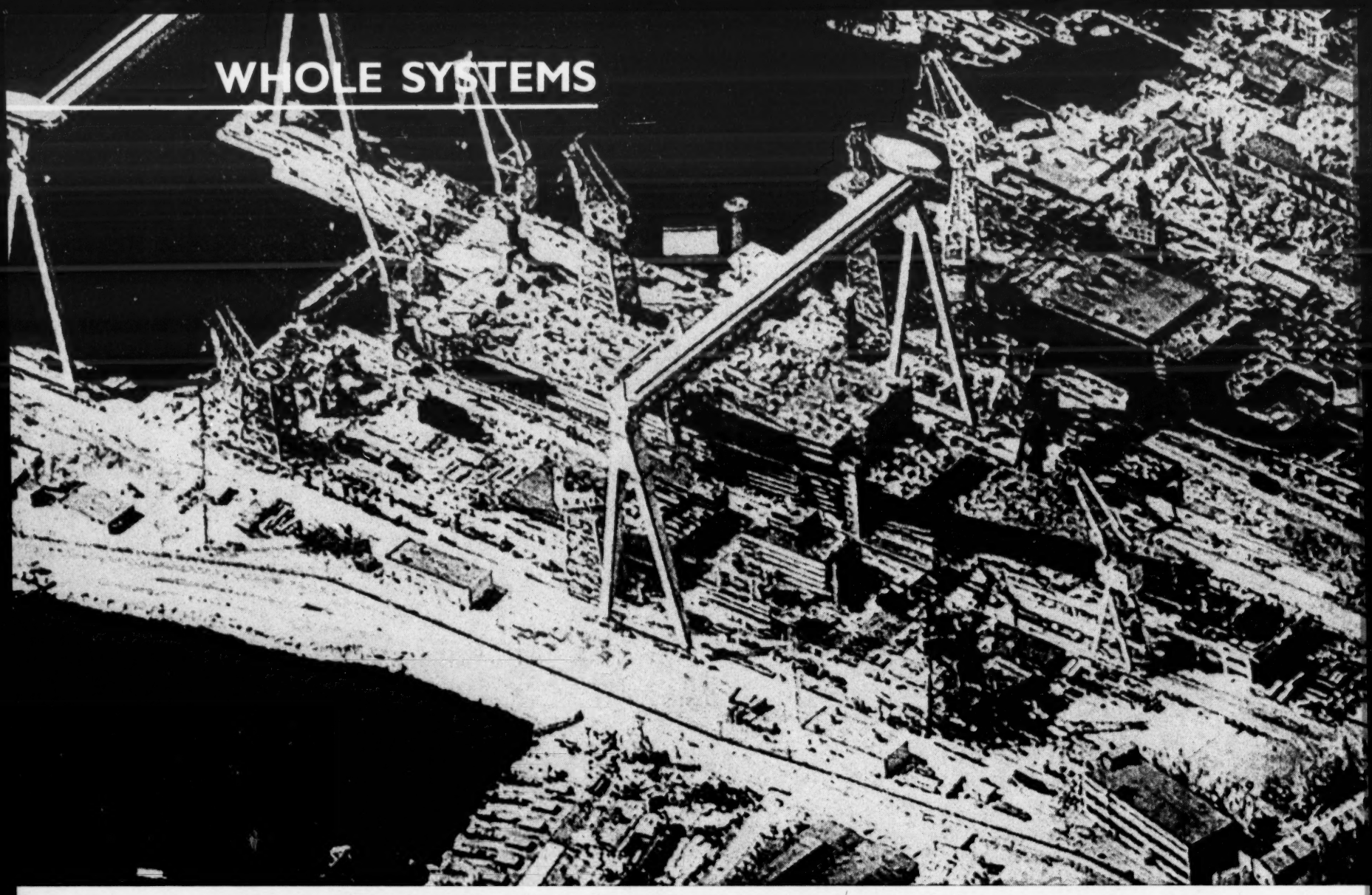
Szent-Gyorgyi pointed out that the molecular structure of many parts of the cell was regular enough to support semiconduction. This idea was almost completely ignored at the time. Even when Szent-Gyorgyi expanded the concept in his 1960 *Introduction to a Submolecular Biology*, most scientists (except in Russia!) dismissed it as evidence of his advancing age, but that little book was an inspiration to me. I think it may turn out to be the man's most important contribution to science. In it he conjectured that protein molecules, each having a sort of slot or way station for mobile electrons, might be joined together in long chains so that electrons could flow in a semiconducting current over long distances without losing energy, much as in a game of checkers one counter could jump along a row of other pieces across the entire board. Szent-Gyorgyi suggested that the electron flow would be similar to photosynthesis, another process he helped elucidate, in which a kind of waterfall of electrons cascaded step by step down a staircase of molecules, losing energy with each bounce. The main difference was that in protein semiconduction the electrons' energy would be conserved and stored in the chemical bonds of food.

•

Most city dwellers continuously get more than a tenth of a microwatt from television microwaves alone. This may be especially significant, because of the human body's resonant frequency. This is the wavelength to which the body responds "as an antenna." Next to the ELF range, it's perhaps the region of the spectrum in which the strongest bioeffects may be expected. The peak human resonant frequency lies right in the middle of the VHF television band.



BONE'S ELECTRICAL SYSTEM GUIDES GROWTH



A computer-enhanced photograph taken from space by a reconnaissance satellite. The scene is of a Soviet shipyard building a nuclear-powered aircraft carrier (in two halves).

Etiquette for the Age of Transparency

Public access to public monitoring from space

by Kevin Sanders

In many ways, we're lucky it was the U.S.S.R. that put up the first artificial satellite. If the U.S. had been first, the Soviets might not have been so eager to embrace an "open skies" policy for spacecraft, a policy which allows any and all objects in space to transit their territory. Aircraft certainly can't do that.

National sovereignty over the airspace above state territory is a well-established principle of international law. The "open skies" policy for space isn't. It's really just a custom evolving into something like a common-law tradition that may eventually be formalized in a treaty.

Until recently, the distinction between aircraft and spacecraft translated into a big difference in the amount of detail that could be gleaned from looking down. The coarser resolution of satellite sensors contributed to the tolerance observed nations have shown toward those viewing them from space. The U.S. has reinforced this tolerance by requiring its civil satellite data be made available to all on a nondiscriminatory basis. As a result, the benefits flowing from "open skies" have been available to all nations, even our potential adversaries.

Now that we're entering an era in which just as much detail can be seen from orbit as from an aircraft, will "open skies" prevail? Will easy access to the data continue to neutralize the sovereignty questions? When you are naked to eyes in the sky, what are good manners?

Born in Australia, Kevin Sanders has been in the U.S. for about 15 years, working mainly as a television news reporter/producer. He is currently putting together an hour-long video program, tentatively titled "Space 2000," based on a series of reports he did originally for CNN.

—Robert Horvitz

THE POTENTIAL PEACEKEEPING ROLE of international earth-observation satellites was first reported in "Draft of a Proposed Speech for a President of the United States" by Howard and Harriet Kurtz in *CoEvolution Quarterly* #20, Winter 1978. With the advent of the first civilian high-resolution satellite, such a monitoring system has suddenly become feasible. But there is also talk in the Pentagon of shooting it down.

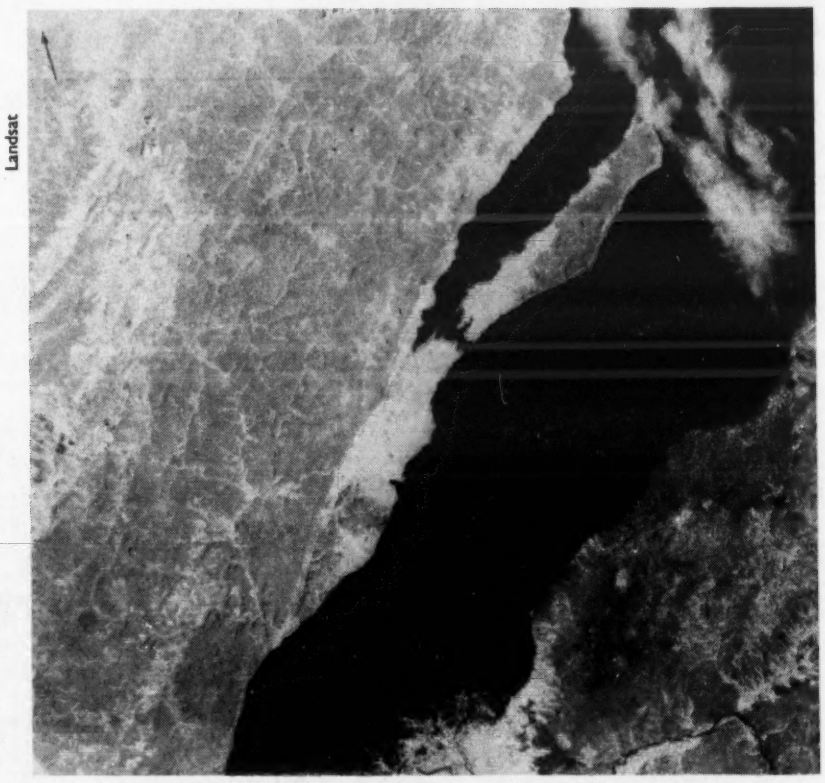
An Ariane rocket recently blasted off from French Guiana in South America, launching into orbit a new European satellite called SPOT (Systeme Probatoire d'Observation de la Terre). It is the world's most powerful and versatile civilian earth-observation system, producing pictures of the earth's surface three times more detailed than those of the U.S. Landsat. Under the 1984 Space Commercialization Act, Landsat has recently been transferred from the U.S. government to RCA and Hughes Aircraft, who will operate it commercially under the name EOSAT (Earth Observation Satellite). But among some U.S. officials there is concern that SPOT has already rendered Landsat obsolete. Reports from Europe suggest that SPOT may also mark the beginning of what Daniel Duedney of the Worldwatch Institute has called "The Age of Transparency," in which all nations can see everything all the time. Such a development cuts at an oblique angle across traditional assumptions of nation-state sovereignty and carries important long-term implications for the superpowers' defense and foreign policies.

The Pentagon currently imposes restrictions on Landsat pictures, limiting them to a resolution of 30 meters (one hundred feet). That means Landsat is not allowed to register anything smaller than 100 feet wide. (As a result, the public has access to considerably more detailed satellite pictures of the surface of the moon than of the earth.) SPOT, a joint enterprise by French government and commercial interests — in association with Belgium and Sweden — is not subject to Pentagon restrictions. It has been designed to detect anything more than 33 feet wide. While Landsat pictures cover a larger area — 180 miles square — SPOT will reveal more detail in its pictures, covering an area 36 miles square. Landsat can distinguish blocks of houses; SPOT will distinguish the individual houses.

Jim Kukowski, head of NASA's Space Science Information office in Washington, D.C., says, "The impact of SPOT on Landsat's commercial viability will be significant. Landsat cannot be changed; it was built to certain specifications. We in the civilian sector can use our sensing devices to get down to a certain resolution where we have to stop. At that point it comes under the umbrella of the Department of Defense." He also notes that some of the unclassified pictures from the U.S. space shuttle orbiter's photographic cameras already exceed pentagon restrictions on Landsat. "In some orbiter pictures we can pick up a 747 in flight," he says. As a result of the ten-meter resolution available from SPOT, another NASA official warns, "We have to ask whether we are giving the private sector a dead duck with Landsat."

Congressman George Brown (D-California), who has long advocated civilian access to high-resolution pictures of Earth from space, predicts, "The U.S. probably will not be able to compete with SPOT, either in the quality of its pictures or the international marketing of the service." But Gilbert Weill, President of SPOT Image

A portion of another view of the same Soviet shipyard (Nilolaiev, along the Black Sea) showing buildings that house technical staff. In the original photographs taken by U.S. military satellites, objects smaller than people can be discerned. Because of the sideviewing capabilities of the new telemetry satellites (see p. 61), extremely revealing oblique photographs are possible. The two images printed here are xeroxes of photos from British journal "Jane's Defence Weekly," which published them in August 1984, much to the angry surprise of the Pentagon. The degraded fourth-generation resolution of the photographs approximates the clarity of the most advanced commercial satellite imagery that may soon be available to the public.



Landsat

An off-the-shelf Landsat satellite view of Lake Baikal in southern Soviet Siberia, not far from the Mongolian border. The resolution is about 80 meters (85 yards), which means objects smaller than 80 meters in area are not distinguishable. New satellites will resolve below 5 meters (16 feet).

(the corporation that owns and operates the satellite), stresses that SPOT pictures can be used in cooperation with Landsat. "SPOT is a logical complement to Landsat," he says. "We offer detailed images that can work in tandem with their more broad-scale product."

At the National Oceanic and Atmospheric Administration (NOAA) in Washington, D.C., an official who asked not to be identified, acknowledged that U.S. reaction to SPOT is schizophrenic. "Even though SPOT will be competition for Landsat, cooperation makes sense; the two satellites gather somewhat different kinds of data serving different needs. Also, we don't know if the present Landsat will continue working until we get the next one in orbit." The next in the series, Landsat 7, is scheduled for launch by the U.S. government in 1988 and will be operated on a commercial basis by a consortium of private space-technology companies. An NOAA official reported that future Landsats have been cleared by the Pentagon to go down to a resolution of 15 meters. SPOT will still be well below state-of-the-art for earth observation from space. Already some of the approximately 100 U.S. and Soviet spy satellites now in orbit are believed to have a resolution of one meter or even less. Anecdotal reports claim that some can see any weapon larger than a rifle, and that on a clear day they can detect the magazine you are holding. Soldiers working on secret projects in the field are ordered not to shine their shoes; the glare from polished shoes marching in step is said to show up in military satellite pictures. General Daniel Graham (ret.), who heads the Washington, D.C.-based Heritage Foundation's High Frontier proposal for a space-based weapons system, boasts, "From space we can tell on which side a man's hair is parted."

Over the years the superpowers have learned to coexist under each other's scrutiny from space. Both concede that spy satellites have helped stabilize relations and reduce tensions. The advent of SPOT, however, undermines the superpowers' monopoly on high-resolution pictures from space, and there are now plans under consideration in Europe to experiment with SPOT data to monitor crisis areas, military activities, and arms control agreements.

International satellite monitoring of peace agreements was first proposed in the early sixties by a Washington, D.C.-based group called War Control Planners, headed by airline executive Howard Kurtz and his late wife, Harriet, a theologian. Edward Teller, a developer of the hydrogen bomb, was an early supporter. "Everything that can be seen from space should be shown in the United Nations," Teller said. The idea finally emerged in 1978 as a French U.N. proposal from an International Satellite Monitoring Agency (ISMA), after being picked up by assistant secretary general of the U.N., Robert Muller.

After a four-year, 12-nation study, the U.N. issued a report in 1982 concluding that an ISMA was "feasible and desirable." According to the U.N. report, each year an ISMA would cost the international community "well under one percent of the total annual expenditure on armaments" and could be operated "with or without the support of the superpowers."

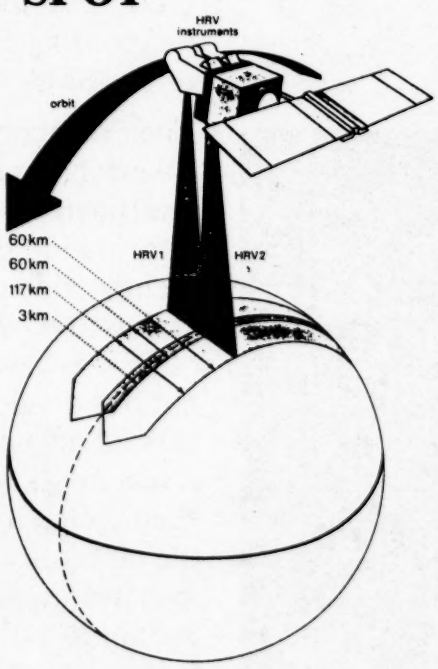
Although the U.S.S.R. voted against the ISMA, and the U.S. abstained, 126 nations voted in support. In 1983, the Parliamentary Assembly of the Council of Europe — a 23-nation body including the Vatican — offered to cooperate with the U.N. through the European Space Agency (ESA), to establish a rudimentary ISMA. They would use data routinely available from U.S. and U.S.S.R. civilian satellites, together with more detailed pictures available from SPOT. The project is currently under further study by a Parliamentary Assembly committee on science and technology. According to John Pike, a space-science researcher at Federation of American Scientists in Washington, D.C., the Europeans are eager to get involved with an ISMA to reduce their dependence on earth observation material they currently get from the U.S. military in exchange for for other "intelligence" information. "A lot of European governments would like to get out of that deal," Pike says.

Howard Kurtz, who sees an ISMA as the first step to what he calls a "global information cooperative," regards the advent of SPOT — and its possible value to an ISMA — as most encouraging. Kurtz is also urging support for a congressional resolution to guarantee limited civilian access to NAVSTAR, the Pentagon's multibillion dollar, 20-satellite, global navigation and tracking system due in place in 1988. "As part of an ISMA, it (NAVSTAR) could be used for global and local security, earth resource management and crisis and disaster relief," Kurtz says. "Back when Harriet and I first proposed these ideas, everyone said we were 25 years ahead of our time," he recalls. "Well, it's been 25 years and the time seems right." (Kurtz has been nominated for the Nobel Peace Prize for his work.)

In a 1982 address to the U.N., British science writer, Arthur C. Clarke — who has dubbed the ISMA "the peacesat" — said it was an idea whose time has come. "Most of its elements are already present in existing or planned systems. The French SPOT with a ten-meter resolution has been mentioned. Whether the superpowers wish it or not, the facilities for an embryo peacesat will soon be available. May I remind my Russian and American friends that it is wise to cooperate with the inevitable."

Despite the current controversy over the Reagan Star Wars proposal — Canada, the Netherlands, France, Norway, Denmark, Sweden, China, Australia and New Zealand refuse to cooperate in research — the degree of international peaceful cooperation in space is, by contrast, already considerable and growing. Given the inherently global nature of space, many believe such cooperation is inevitable. All nations already cooperate in the space-based telecommunications system, Intelsat. The European Spacelab — involving all 12 nations of ESA and Canada — flies on the U.S. shuttle. Australian tracking facilities will follow the European Halley's probe. France, Canada, the U.S. and the U.S.S.R. are involved in the Search and Rescue Satellite system (SARSAT). Like the international postal service and civilian air traffic controls, satellite-based systems for communication, meteorology, astronomy and earth observation require a high degree of international cooperation to function efficiently. For example, the SPOT scanning programs are directed from mission control in

THE GIANT EYES OF SPOT



Using the latest microchip technology — a pair of "pointable" electronic scanners, each with 6000 sensors aligned on CCDs (charge-coupled devices) — SPOT will provide stereoscopic, color-enhanced pictures of the Earth's surface. Circling the planet every 70 minutes at an altitude of 520 miles, in what is called a "near-polar" orbit, SPOT will systematically observe the entire earth except the tips of the polar caps. It will cross over any given area of the planet every 26 days. But since the computer-controlled scanners — the eyes of the satellite — can be maneuvered to either side to "pre-visit" or "revisit" any specified location, observations of the same area will be possible on a near-daily basis, thus providing "sequence" pictures of rapidly evolving events such as storms and floods. In addition, SPOT will be able to scan back and forth along the ground tracks, which together with the "sideways look" capacity will provide for the first time in a civilian satellite the information to construct stereoscopic pictures of the Earth's surface "texture."

At SPOT Image headquarters in Reston, Virginia, the administrative manager, Nadine Binger, explained that pictures of whatever kind — black and white (at ten-meters resolution) or color (at 20-meters resolution), flat or 3-D, single-picture or time-sequence — will be available for sale to anyone, including government agencies, corporations, universities, media and private individuals. "It's just like selling toothpaste," she says. "Customers will be those who want the information for agriculture, forestry, meteorology, oil and mineral exploration, mapping, oceanography, and environmental, urban and regional planning."

Unlike Landsat and the Large Format Camera, which were research programs designed to find out what the technology was capable of detecting, SPOT was conceived from the start as a business venture. That should mean faster and easier access to the data, and more customer control over data acquisition. In terms of service, their most intriguing innovation is that you won't have to settle for just what's in stock. You'll be able to ask them to shoot the exact location you want, in black and white or false color. Scene requests will be radioed up to the satellite every day. Up to 60,000 scenes are expected to be acquired for general inventory next year.

The data will available on computer-compatible tapes, photographic film (positive or negative) and on photographic paper. Each scene will cover 60 km x 60-85 km.

A rough ball-park range of prices: a photographic print or transparency will cost between $300 and $1,500, averaging $500 each depending on requirements. Geometric correction (adjusting the distortion due to side-viewing) increases the average price to $800 per photo. Digital tapes for image manipulation will raise the cost to over $1,000 per scene.

Exact figures and ordering information will be available from SPOT Image, 1897 Preston White Drive, Reston, VA 22091-4326; 703/620-2200.

Toulouse, France, yet the digital data from which the pictures are reconstructed will be collected through a network of receiving stations in 12 countries, with more soon to be involved. Already 48 nations have ordered test pictures.

At a meeting in Washington, D.C., last year, Dr. Caesar Voute, chief of the Netherlands-based International Institute for Aerial Survey and Earth Sciences, predicted that, as such cooperation expands, "Interdependence will take the place of detente and coexistence." Dr. Voute regards the ISMA as an opportunity for all nations to work together for common global security. "We are at an historic turning point," he said, "But it will require a new approach by mankind to reap the benefits of space."

Ironically, President Reagan's proposal to share Star Wars technology with the world would entail the greatest international cooperative endeavor ever undertaken. Armand Hammer, president of Occidental Petroleum and friend of both President Reagan and Secretary Gorbachev, has challenged President Reagan to offer an immediate exchange of space weapons technology. But historian William Irwin Thompson has mocked what he regards as the inherent absurdity of the idea, arguing that, paradoxically, it would also require such a massive level of trust in the exchange of nuclear, space and computer technologies "with Rockwell subcontracting space weapons construction to the Russians" that a situation would soon be reached in which it would be easier, cheaper and safer simply to disarm the bombs on earth and secure space for peaceful purposes.

But even purely civilian spacecraft present ambiguities of conflict and cooperation. Considerable international confusion exists over the military implications of satellites. Earlier last year, just before he left for Geneva to begin the first round of arms negotiations with the U.S.S.R., U.S. chief negotiator Max Kampelman astonished a group of space-cooperation activists by telling them, "There are already thousands of weapons in space." After some enquiries he modified the number to "hundreds." A few days later, after being challenged further on the statement, Kampelman explained that he was referring to the military observation and communication satellites. A similar confusion seems possible over SPOT, since its data could also be used to identify military movements and installations. Would this make it a "weapon?" Are there circumstances in which the U.S. would consider using antisatellite weapons against SPOT or other components of an ISMA?

NASA

Crops can be monitored via satellites. Those with access to this information will often know more about the overall harvest of an area before its own farmers or local government. The dark patches in this low-altitude image of Jamaican fields indicate lush vegetation.

The Pentagon is reluctant to discuss the issues. "We don't want to reveal the range of our ASATs (antisatellite weapons)," said U.S. Air Force information officer Ron Rand. But Jonathan Weiner, aide to Senator John Kerry (D-Massachusetts), who opposes ASAT testing, says, "SPOT is clearly vulnerable, particularly if nations develop laser weapons." A Pentagon official acknowledged that if SPOT were to reveal military activities the U.S. wanted to keep secret, and if France refused to withhold the pictures, "It would be a perfectly logical scenario that SPOT could be targeted." David Julian, SPOT Image vice president, says the billion-dollar SPOT system carries no defense, and adds, "The possibility of an ASAT attack has not been discussed." He speculates it would be, "unlikely, since existing military satellites can already see much more." But Congressman George Brown claims, "The development of ASATs will inevitably pose a mortal threat to the whole international civilian space enterprise." (Currently congress has ordered a halt to U.S. ASAT weapons testing unless the Soviets resume their program.)

Possibly in anticipation of such tensions, French President Mitterand has proposed an independent European space station be used to

Above San Francisco

Gate Five Road, our backyard. We fuzzed an aerial photo of the Sausalito waterfront where our offices are (we're in the box the arrow points to) to simulate the quality of a 2-meter satellite shot. (Two-meter resolution means that objects smaller in size than 2 meters aren't discernible.) The technology to gather images of this quality from any back yard on earth already exists.

"observe, transmit and counter any eventual menace." He suggested recently that the French-built civilian science and technology platform, Eureca, which is due to be launched in two years, could be adapted for European space defense. Some observers believe the French statements merely reflect European resentment of President Reagan's failure to consult other nations prior to his public announcement of the Star Wars project.

However that may be, other nations are developing an increasing stake in space, and a growing concern for its security. Four more SPOT satellites will be launched in the next ten years, and West Germany, Japan and ESA also have earth observation satellites in the works for later this decade — some with picture quality and resolution even better than SPOT's. Charles Sheffield, vice president of the privately owned, Washington D.C.-based Earth Satellite Corporation, predicts the trend will continue. "By the year 2000 it is hard to imagine that there will be any limits on resolution of spaceborne sensors, other than those imposed by the technical state-of-the-art of the future optical systems," he says.

Eventually a network of such satellites — perhaps in the form of an ISMA — may become what science writer Ben Bova calls "a Swiss guard in space." Some believe such a system could pose an international counterforce to the growing threat of the weaponization of space. It could herald an age of international governance with a third force in orbit to triangulate the political dynamics of space with the superpowers.

The coming age of transparency is likely to require a new international etiquette and will raise a number of questions that have, as yet, been little considered: Will governments respond with greater civility or greater stealth? Will national and even personal privacy yield to the requirements of world security or have they already? Will orbital space become a superpower battlefield or a global commons? These are but a few of the issues the superpowers may have to consider now that the giant eyes of SPOT are in orbit, sending back from space the best pictures we have ever been allowed to see of our planet. They are available from SPOT without restriction for about a dollar an acre. Extra for 3-D. ■

WHAT HAVE YOU

Ocean Earth/Landsat

Before: The border near Basra and Abadan, as viewed from Landsat 2 in 1977. Resolution in this image is 80 meters. Resolution in the other, more recent view of this region is 30 meters. The improvement is due to a more sophisticated sensor, the Thematic Mapper, being added to Landsats 4 and 5.

by Peter Fend and Ingo Gunther

DURING the 1960s and the 1970s, visual artists began moving into film and video as display media and into landscapes and ecosystems as sculptural or architectural material.
Many wanted to deal directly with the conditions of life on Earth, not just to decorate the walls of the elite; many felt that the mass media had become a more effective field of action than museums and galleries. Out of that ferment came Ocean Earth.

The Ocean Earth Construction and Development Corporation was founded in 1980 to undertake projects larger than was possible for any one person and of broad public rather than just art-world service. Our interest in large-scale modification of the Earth soon led us to become experts in the analysis and presentation of satellite imagery. Ocean Earth appears to be the first and only company regularly conducting surveys with civil satellite data of military phenomena.

Further, we seem to be the only company committed to disseminating the results of such surveys to the general public via television and news publications. Others are likely to follow soon, however.

GOT TO HIDE?

Ocean Earth/Landsat

Careful analysis of civilian-grade Earth observations from orbit can yield information with significant military intelligence value. This was established by our first published project, a Landsat survey of the Falkland Islands just prior to the British invasion in 1982. The British Admiralty requisitioned the material we had sold to the BBC, and we were approached with contract offers by the U.S. Defense Intelligence Agency (DIA). Since that experience, Ocean Earth has steadfastly avoided dealings with belligerent parties in a conflict. We rejected the DIA offer, and the U.S. military went on to develop Landsat analysis programs of its own in all three major branches of the service.

As civilians, without access to official plans or secrets, we have discovered facts in virtually all of the projects conducted so far that gave us insight into actual and potential crisis situations superior to that enjoyed by those relying on more traditional newsgathering techniques. Satellite surveys are particularly useful for understanding conflicts based on resource-control rivalries.

For example, in a preliminary survey of Lebanon early in 1983, we found satellite evidence that suggested Israel had begun diverting water from the Litani River in Lebanon, depriving the residents of the area of a resource essential to their lives. ►

After: Landsat view of the same locale, January 20, 1985.

What began as a linear trench grew into a wedge-shaped lake that spilled into meandering extensions that cross into Iran. The Iraqis had to remove some 400 million cubic meters of salt-laden clay to create this water shield. Its primary purpose seems to be to protect Basra from the estimated one million Iranian soldiers massed on the other side of the border. Preparations for additional channels on the Iranian side of the border are visible. These may represent an Iranian attempt to drain the water, or an Iraqi attempt to block Iranian defense of Abadan.

We were unable to find a news bureau willing to sponsor a more detailed investigation because none of the editors we approached thought the issue would be timely or "hot" enough to justify the cost of our research. We believe that the water diversions catalyzed the Shiite unrest in that part of Lebanon, which in turn provoked the bloody Israeli crackdown.

In 1981, the Iraqi government claimed that it had a "secret weapon" in its year-old war with Iran. Speculation about the nature of this weapon centered on Exocet missiles, poison gases, and the like — until we discovered (and reported — see especially our article in the *New Scientist*, January 17, 1985) that the weapon is a massive water project in the salt flats east of Basra.

Landsat images of the Iran-Iraq border from 1977 onward show the excavation of a straight trench 30 km long by 1.2 km wide. By April of 1981, the Iraqis had flooded the trench with water pumped from the nearby Tigris and Shatt al Arab rivers through smaller canals. Since 1982, Iran's "human waves" have attacked Basra in vain, foundering in the "killing fields" east, north, and south of that moat.

Construction has continued, often under heavy enemy fire. By the beginning of 1985, the water shield had expanded to include an artificial lake some 10 km wide, framed by the original trench and the border, and two broad channels, one heading north, the other southeast toward Abadan. Wherever the water extends, the Iraqis come in behind with artillery and armor to set up fortified positions. Our processing of the satellite data shows these encampments clearly. We supplied computer-enhanced videos to CBS and ABC news.

Since last fall, we have been working with a Dutch television company on a satellite survey of Soviet military installations. Among other things, we are attempting to locate active SS-20 missile sites and to assess the Soviet build-up in the Far East and in Afghanistan.

Amidst the flurry of claims and counterclaims as to exactly how many SS-20 missiles are deployed where, there has been no visual evidence of any SS-20 deployments released by either the U.S. government or the U.S.S.R. The number and location of the missiles has been a key factor in the decision by some European countries to accept the new U.S. missiles, but the only source of this data has been the two governments most interested in influencing the decisions. An independent assessment would be a test of the superpowers' honesty.

All national governments have an interest in promoting the perception of "threats to the nation." So long as they also monopolize the evidence for such threats — and have the temptation and the ability to exaggerate — we are all held hostage to their public relations maneuverings. Ocean Earth believes that the worldwide arms race is likely to continue until nongovernmental assessments of military threats become as credible as government declarations — until the tendency of all governments to maximize the apparent magnitude of external threats is brought into check by independent observers.

What we do is not espionage. According to a recent study by Thomas J. Keating, a legal intern at the National Association of Broadcasters, "An early viewpoint that such military sensing . . . constituted espionage was later repudiated by the current position of the states with access to space. These states now believe that remote sensing from space which provides data on military capabilities is a peaceful, lawful and stabilizing space activity."

Nevertheless, it has been perceived to be against the interests of certain people for us to publish. The parties that feel most threatened by our work (and most competitive with us) are governments. To that we can only say the era of government control over information about current military situations is over. What we alone do now soon may be done routinely by large networks and bureaus. "Early in 1986," writes Stanley Wellborn in the National Association of Science Writers' newsletter, "several television and print organizations hope to explore the possibility of buying or leasing an orbiting photo reconnaissance satellite as a news reporting vehicle. This idea has been suggested many times over the last 20 years, but it gained new impetus in the wake of the Grenada invasion, the war in the Falklands, and the unrest in Central America."

Charles Sheffield, vice president of Earth Satellite Corp., notes that "the present generation of Landsat and SPOT spacecraft are nowhere near the technological limits of either spatial or spectral resolution. I expect to see spatial resolution in the 3- to 5-meter range by the year 2000, available worldwide for open purchase." Dr. Sheffield also predicts "The ultimate limiting factor on spatial resolution for satellite systems will be decided not by defense concerns, but by economics."

As the resolution and spectral pliability of satellite data increases, its informativeness increases exponentially. Regular use of satellite imagery will, we think, change the form and content of television news: Television will become tele-vision (far seeing). Regional contexts and large dynamic processes can be made visible, vividly and authoritatively. Synoptic views from orbit can show the conditions underlying much unrest in the world, the progress of the Soviet wheat harvest, the impact of a hurricane, changes along the Pakistan-Afghanistan border, the damage caused by acid rain . . .

At present, however, satellite surveys do not fit the rhythm of daily deadline-driven journalism. A thorough analysis requires pandisciplinary input and can take a month or more. But there are many situations where a month or two doesn't reduce the news value of what is revealed.

Ocean Earth's objective is comprehensive satellite monitoring, in video format, of the globe. We think this can only make the world a saner, safer place to be. ■

Peter Fend and Ingo Gunther exhibit the artwork they do as individuals (Peter works mostly with large satellite photo-montages and maps; Ingo does video installations), but their current joint effort now goes into an organization called Ocean Earth, where they form the core of a shifting team of people producing extraordinary news features using methods that are themselves newsworthy.

Ocean Earth's offices are at Heinrich-Heine-Allee 19, 4000 Dusseldorf 1, West Germany, and 77 Irving Place, 2nd Floor, New York, NY 10003.

—Robert Horvitz

Valleys and ridges northwest of Roanoke, Virginia, stand out in sharp relief in this enhanced false-color Landsat image. To sharpen the relief, a computer has exaggerated tonal contrasts between eastern, illuminated slopes and the shaded western sides.

Atlas of North America

Maps and illustrations of a quality readers have come to expect from ***National Geographic****, keyed to, and supplemental to, a wondrous display of what surely must be the quintessence of space-based photographs.*

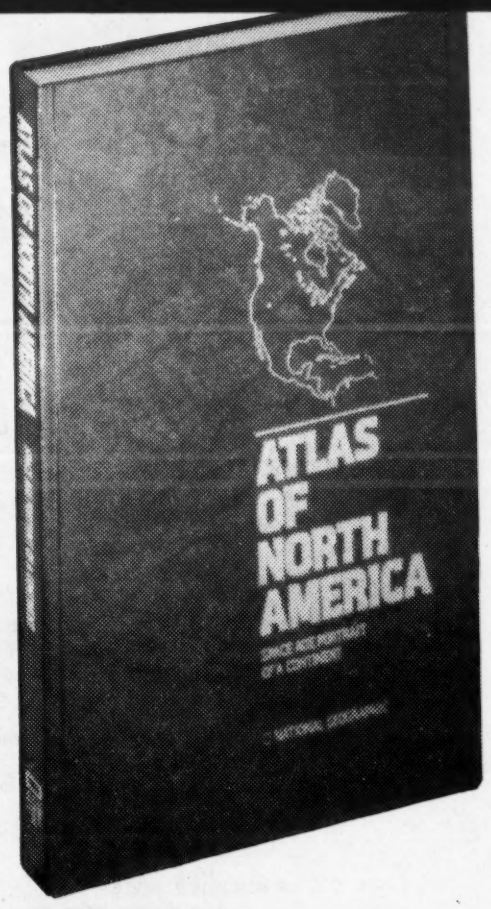
Though nominally North American, the coverage slights Canada to the benefit of Mexico, Central America, and the Caribbean, and misses parts of the great plains and arctic to concentrate on the continental periphery, where the action is — both geographic and chromatic. It is, after all, the color photos (from unmanned satellites, satellite and shuttle crews, and from aircraft) (and printed in task-directed, not necessarily natural, color) which make this atlas unique.

You've seen photos of this kind before — NASA rewarding the loyal taxpayers for their bucks — but the books have been getting further between and their images less startling. This book may be the forerunner of a more mature exploitation of the medium: space imagery at work. With text, maps, and illustrations for explanation, detail, and context, and with coherent organization, one can actually learn a good deal.

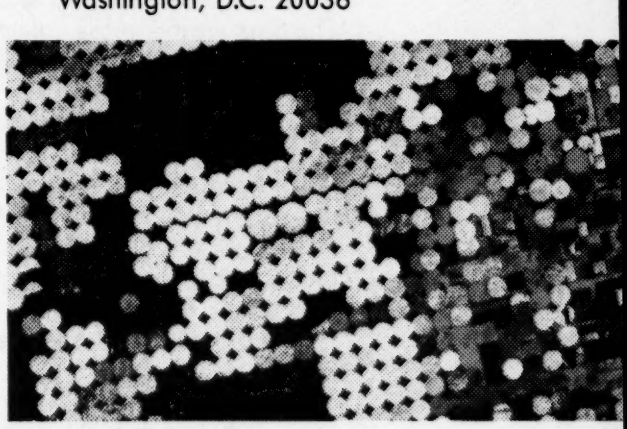
One of the things you can't miss: Geography — that everything is indeed connected and related, atmosphere to hydrosphere to lithosphere, in forests, deserts, ocean currents; in canyons and prominences; in the merest presence of human settlement to the densest pavement, all seen through the water-clear envelope of light and cloud and shadow.

Another thing to be learned: that many of the images were drawn from commercial and institutional, non-federal sources — another sign of maturity in the industry.

—Don Ryan [Suggested by David Burnor]



National Geographic Atlas of North America
Wilbur E. Garrett, Editor
1985; 264 pp.
$39.95
($43.95 postpaid) from:
National Geographic
Washington, D.C. 20036



A confetti of cropland shows irrigation at work south of Garden City, Kansas, along the Arkansas River.

The Implications of Establishing an International Satellite Monitoring Agency

This report has generally been ignored by the U.S. media, much to the delight of military and commercial space interests and much to the detriment of world peace, say its supporters. It shows how an international satellite monitoring agency would work in practice, who would manage the sensors and the data, and what the impact might be. Essential reading for the Age of Transparency, and a damn good idea. —Robert Horvitz

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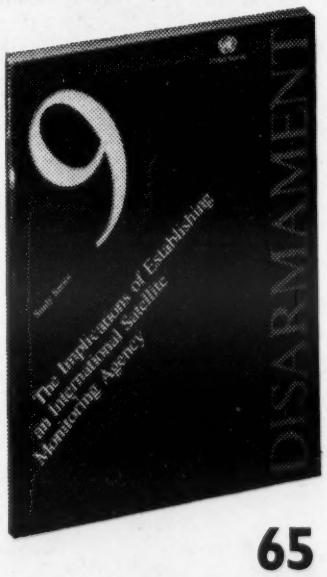
From a technical point of view observations from satellites for the purpose of information gathering related to verification of compliance with treaties and for crisis monitoring is both possible and feasible. The technical facilities for an International Satellite Monitoring Agency (ISMA), including the satellites necessary to carry out the needed missions, could be acquired in stages: for instance, Phase I could comprise only an image processing and interpretation centre, Phase II could comprise data-receiving stations that could receive appropriate data from observation satellites of various States and in Phase III where the Agency could have its own space segment comprising a number of satellites.

From a legal point of view, there is no provision in international law, including space law, that would entail a prohibition for an international governmental organization such as an ISMA to carry out monitoring activities by satellites.



The Implications of Establishing an International Satellite Monitoring Agency
United Nations
Document No.
E.83.IX.3
1983; 110 pp.
$12.50
postpaid from:
United Nations
Sales Section
New York, NY 10017

Phoenicopter's Head

Nehemiah Grew's flamingo, 1681. The illustration accompanying the first important proposal that flamingos feed by moving their upper jaw up and down against their lower. Look at this figure upside down as well.

The Flamingo's Smile • The Problems of Evolution

As the 20th Century becomes increasingly a biological one (even computers are headed that way), it is well to check in on what biology has to offer. Physics is still groping for its unified field theory, but biology has had its for a century. The theory of evolution has grown in subtlety and scope since Darwin, it continues to abound with consequential news, and both the news and the consequence are readily understandable by the nonspecialist.

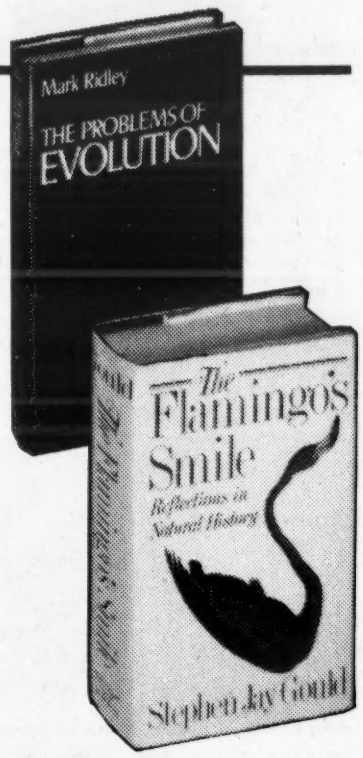
The most ingratiating of all evolution writers has to be Stephen Jay Gould, whose monthly column in ***Natural History*** *($20/year [12 issues] from Natural History, Central Park West at 79th Street, New York, NY 10024) has been a beacon of scientific essay style for some ten years now. The cash crop of those columns is a sequence of books, all still worthily in print —* ***Ever Since Darwin, The Panda's Thumb, Hen's Teeth and Horse's Toes,*** *and the new one still available only in hardcover,* ***The Flamingo's Smile****. (The flamingo's smile, in case you're wondering, is upside down because the bird feeds upside down, illustrating a fundamental and still sometimes controversial point: in evolution form follows function rather than vice versa; behavior change precedes physical change.) This book is particularly thrilling since we get to watch Gould's major scientific contribution, the idea of "punctuated equilibrium" (evolution by spurts), dealing with the emerging evidence of periodic mass extinctions, which apparently deal a whole different kind of articulation to the text of time (sort of like paragraph breaks, come to think of it; think I'll take one now . . .).*

The appeal of Gould is also his application. He finds illustrations of evolutionary themes absolutely everywhere — in comics (the infantilization of Mickey Mouse's face), in baseball batting averages (the extemes narrow with time), in Alfred Kinsey (his landmark sex research followed landmark wasp research). The reader acquires an evolutionary eye constantly rewarded because one theory fits all.

Other specialists — mathematicians, historians, political activists, computer scientists, linguists, psychologists — frequently mine current evolutionary thought for ideas. For them there is an intense little book that summarizes the state of the art in evolution better than any — ***The Problems of Evolution****, by Mark Ridley. Only ten short chapters: "Is Evolution True?," "The Nature of Heredity," "The Mechanism of Evolution," "Natural Selection in Action," "Molecular Evolution," "Principles of Classification," "Why Do Species Exist?," "How Can One Species Split Into Two?," "The Rates of Evolution," and "Macro-evolution." You read his sentences twice — not because they're ill-written, but because they tell so much with so few words.* —*Stewart Brand*

The Problems of Evolution
Mark Ridley
1985; 159 pp.
$8.95 from:
Oxford University Press
16-00 Pollitt Drive
Fair Lawn, NJ 07410
or Whole Earth Access

The Flamingo's Smile
(Reflections in Natural History)
Stephen Jay Gould
1985; 476 pp.
$17.95
Ever Since Darwin
(1979) $4.95;
The Panda's Thumb
(1982) $4.95;
Hen's Teeth and Horse's Toes
(1983) $15.50;



all from:
W. W. Norton
500 Fifth Avenue
New York, NY 10110
or Whole Earth Access

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Although species may be discrete, they have no immutable essence. Variation is the raw material of evolutionary change. It represents the fundamental reality of nature, not an accident about a created norm. Variation is primary; essences are illusory. Species must be defined as ranges of irreducible variation.

This antiessentialist way of thinking has profound consequences for our basic view of reality. Ever since Plato cast shadows on the cave wall, essentialism has dominated Western thought, encouraging us to neglect continua and to divide reality into a set of correct and unchanging categories. Essentialism establishes criteria for judgment and worth: individual objects that lie close to their essence are good; those that depart are bad, if not unreal.

Antiessentialist thinking forces us to view the world differently. We must accept shadings and continua as fundamental. We lose criteria for judgment by comparison to some ideal: short people, retarded people, people of other beliefs, colors, and religions are people of full status. —*The Flamingo's Smile*

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But another overarching, yet often forgotten, evolutionary principle usually intervenes and prevents any optimal match between organism and immediate environment — the curious, tortuous, constraining pathways of history. Organisms are not putty before a molding environment or billiard balls before the pool cue of natural selection. Their inherited forms and behaviors constrain and push back; they cannot be quickly transformed to new optimality every time the environment alters.
—*The Flamingo's Smile*

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The trait will prevail in nature that is produced by the faster process. In the case of altruism and selfishness, organismal selfishness is favoured within a group by organismal selection; but groups of altruistic organisms go extinct less often, and reproduce more rapidly, than groups with more selfish members. (Group reproduction takes place when a new colony is set up by members of the 'parental' group.) Group selection favours altruism. Organismal selection favours selfishness. Group selection takes place over the time-scale of group extinction and group reproduction; organismal selection therefore must be faster. —*The Problems of Evolution*

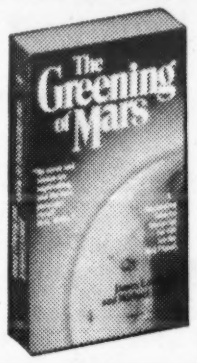
The Greening of Mars

British scientist James Lovelock, the co-author of the Gaia Hypothesis — which suggests how Earth's life uses the atmosphere to regulate the planet — has co-authored a novel on how to do something similar with Mars. Lovelock's credentials to devise such a scheme are impressive. Back before the Viking probe of Mars' surface, he was hired by NASA to analyze the chances for life on Mars by studying the Martian atmosphere. His conclusion — no life on Mars because its atmosphere is so chemically stable it shows nothing is fiddling with it — was hushed up by NASA, but there was a nice byproduct: because Earth's atmosphere is so chemically unstable that the presence of life is required to explain it, Lovelock's Mars research led directly to the Gaia Hypothesis.

What is particularly appealing about his plan to green Mars is its low-cost, nongovernmental, realistic, unromantic, even somewhat tawdry approach. He would gather up the world's obsolete solid-fuel missile rockets (available to anyone who can reasonably dispose of them), lash them together, and fire them in the general direction of Mars. For payload they carry the world's warehoused and outlawed chlorofluorocarbons (remember when spray deodorant threatened our precious ozone?), which are released upon collision with Mars. As a greenhouse gas the chlorofluorocarbons are 100 times more potent than the CO_2 that worries us on Earth — frozen Mars starts rapidly warming toward livability. Throw in a few Antarctic lichens to multiply and darken Mars' albedo (reflectivity). Within 11 years humans can begin to arrive in semi-comfort and accelerate the process.

I find the book mildly interesting as a novel but riveting as a proposal, not least because it offers such a radical departure from the usual grandiose schemes of "terra-forming" — planetary air-conditioning projects. A number of young scientists have been intrigued enough by the British edition of this book to call a meeting in Canada to discuss the implications of its ideas. One term that came out of that meeting I just love — "ecopoiesis" — "the process of a system making a home for itself."

—Stewart Brand



The Greening of Mars
James Lovelock
and Michael Allaby
1984; 215 pp.
$3.50
($4.50 postpaid) from:
Warner Books
P. O. Box 690
New York, NY 10019
or Whole Earth Access

•

Freeman Dyson related the costs of space colonization to the costs of the *Mayflower* migration to North America, and to the Mormon crossing of the United States in 1847, by translating records of the accounts kept of those enterprises into 1975 monetary values. He found that the *Mayflower* expedition cost each family a sum equal to the wages a person might earn by 7.5 years of work. The Mormon expedition, on the same basis, cost 2.5 years of work per family.

His space 'colony' would have cost 1500 years of work per family, although that never was realistic, but another project, to 'homestead' asteroids, might have cost only six years. In 1982, James Oberg (in *Mission to Mars**) calculated that a manned expedition to Mars, with five astronauts, might cost about $20 billion, which is a little more than it cost to develop the Shuttle orbiter, and less than one-third of the cost of the Moon landings. Once it became clear that the equipment could be produced in quantity, that to begin with the launch vehicles could be supplied and fuelled free, and that the travellers did not plan to return to Earth, the figure of $20 billion had to be reduced substantially. Costed over all the equipment for all the journeys, and divided by the number of families travelling, the final price for a ticket to Mars dropped to the equivalent of three of Dyson's 'man-years.' In other words, at average wages prevailing at the time, it would have taken one person three years to earn the price of a ticket for a family of two adults and two children.

* Stackpole Books, Harrisburg, PA, 1982.

Contact

Space scientist Carl Sagan has written a fine piece of science fiction. It works as a novel — interesting characters (all the main ones women), thrilling story, acrobatic plot. And it works as science — for once the scientists are believable, their interactions, the way they talk, and what excites them. Since SETI — the Search for ExtraTerrestrial Intelligence — is a discipline without an object as yet, fiction is a perfectly reasonable place to play out its reasons for being. Here they are inventive and persuasive.

—Stewart Brand

•

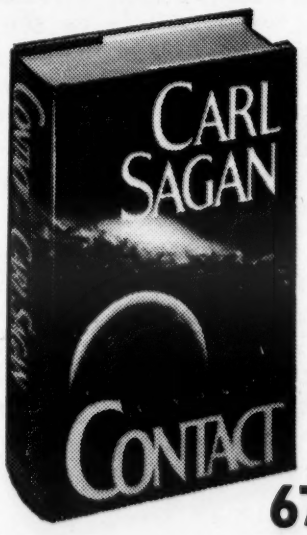
"I mean, Ms. President, that our television signals leave this planet and go out into space."
"Just exactly how far do they go?" . . .
"The signals spread out from the Earth in spherical waves, a little like ripples in a pond. They travel at the speed of light — 186,000 miles a second — and essentially go on forever. The better some other civilization's receivers are, the farther away they could be and still pick up our TV signals. Even we could detect a strong TV transmission from a planet going around the nearest star."

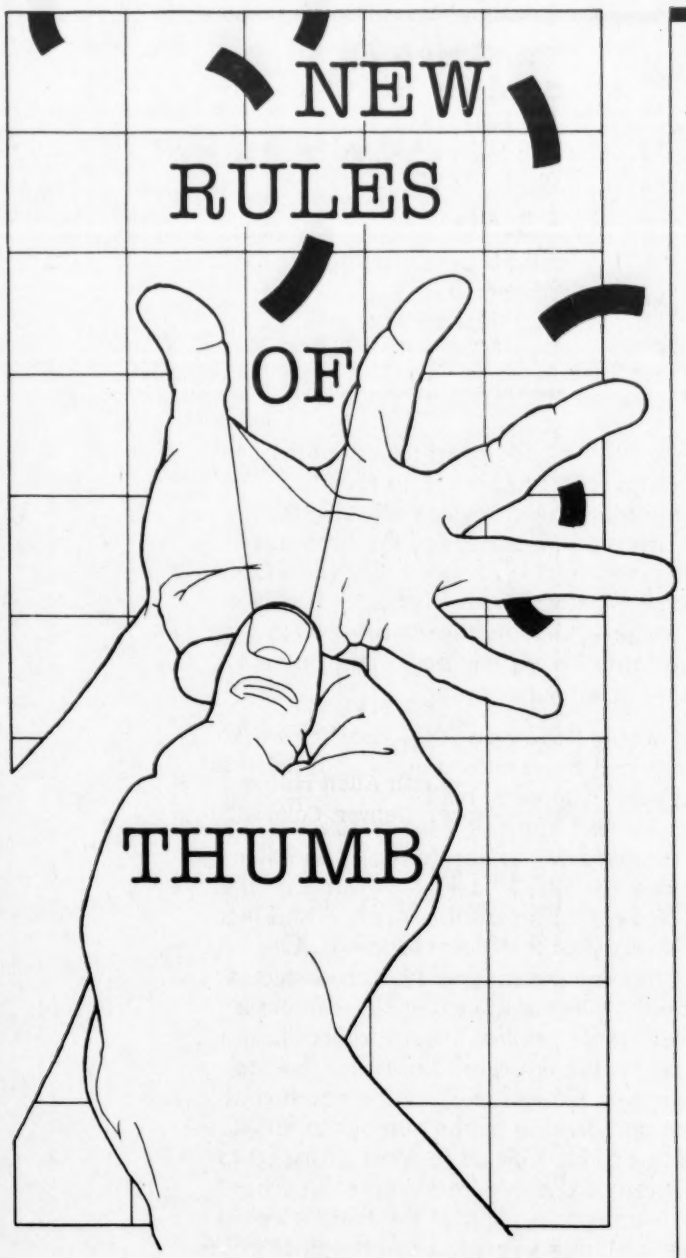
For a moment, the President stood ramrod straight, staring out the French doors into the Rose Garden. She turned toward der Heer. "You mean . . . everything?"
"Yes. Everything."
"You mean to say, all that crap on television? The car crashes? Wrestling? The porno channels? The evening news?"
"Everything, Ms. President." Der Heer shook his head in sympathetic consternation. . . .

"Look at it this way: Those few minutes of television from Vega were originally broadcast in 1936, at the opening of the Olympic Games in Berlin. Even though it was only shown in Germany, it was the first television transmission on Earth with even moderate power. Unlike the ordinary radio transmission in the thirties, those TV signals got through our ionosphere and trickled out into space. We're trying to find out exactly what was transmitted back then, but it'll probably take some time. Maybe that welcome from Hitler is the only fragment of the transmission they were able to pick up on Vega.

"So from their point of view, Hitler is the first sign of intelligent life on Earth. . . ."

Contact
Carl Sagan
1985; 320 pp.
$18.95
($20.45 postpaid) from:
Simon and Schuster
1230 Avenue
of the Americas
New York, Ny 10020
or Whole Earth Access





by Tom Parker

"A good rule of thumb turns information you have into information you can use," said a friend of mine when she saw my collection of handy axioms. This current crop began as a response to my first two harvests of rules of thumb in CQ #35, p. 4, and CQ #39, p. 100. These and other gems were assembled into a book called, plainly enough, Rules of Thumb ($5.95 from Houghton Mifflin, Wayside Road, Burlington, MA 01803).

I pulled these rules of thumb from a box of some 500 new submissions sent to me. They'll give you an idea of what I get in the mail. I need more, too. There's a Rules of Thumb Number 2 in the works and, incredibly, after two full years the original book continues to sell. But what I really love is the mail; it's like getting birthday cards all year long! There are the clever one-of-a-kind rules on the back of a postcard, and the wonderful three-page collections from some old salt in the merchant marine.

Rules of Thumb from WER readers are generally the best. . . . So I'm hoping that this batch can serve as a new "call for entries." That address again is: Tom Parker, Box 198, RD 1, Alpine, New York 14805. Our local mom-and-pop office will pass them along as soon as they get done reading them.

Catching a bank robber: Suspects fleeing the scene of a crime will make right turns more often than left — a normal reaction as they do not want to waste valuable time waiting for cross traffic to clear. If you didn't see which way they went, try turning right. —John Howsden, police sergeant, Fremont, California

Choosing a surgical assistant: Choose an assistant surgeon whose height is within five inches of yours. Otherwise you will disagree on the height of your surgery table and if your operation is long, one of you will end up with back pain.

—Gerry M. Flick, M.D., Ship's Surgeon, S.S. Constitution, off Hawaii

Buying a slinky: Never buy more than one Slinky, because they will eventually become intertwined. Andy Steinberg, Louisville, Kentucky

Watching worms: On rainy nights, 90 percent of the worms crossing a highway will be facing the same direction.

—Emery Nemethy Catawissa, Pennsylvania

The Civil War rule: Plan on using a man's weight in lead to kill one in battle.

—Bob O'Halloran, talkshow host, WHBY Radio, Appleton, Wisconsin

Eating at a vegetarian restaurant: Don't order anything at a vegetarian restaurant that would have meat in it if served elsewhere.

—Steve Carver, illustrator Los Angeles, California

Checking food: Foods that are normally hard (crackers, carrots, potato chips) are bad if they've turned soft. Foods that are normally soft (bread, cake, pudding, soft cheese) are bad when they've turned hard. Milk is an exception—it turns from a liquid to a soft solid.

—Herman N. Cohen, personnel manager, New York City

Harvesting raspberries: When you start to find garden spiders in your raspberries, you have one week left to pick.

—Carol Ayer, raspberry grower, West Bend, Wisconsin

Getting tickets to a play: You can always get a seat or two for any play in bad weather—and the "no show" seats are generally better than the ones your friends got by ordering weeks in advance.

—Kelly Yeaton, teacher and stage manager, State College, Pennsylvania

Tracking a diabetic: If you find ants around a toilet, suspect that a diabetic may be using it.

—Gerry M. Flick, M.D., ship's surgeon, S.S. Constitution, off Hawaii

Hiding from a tornado: Seeking shelter from a tornado in a wet ditch is only OK if there are no electrical wires to fall into the ditch with you.

—Mary Henshaw, Baytown, Texas

Entertaining older people: Older people are consistently early arrivers. If you plan a luncheon for 12:30, expect all the older guests to arrive by noon. —Berwyn Russell, retired, Indiana, Pennsylvania

Gauging alligators: The distance between an alligator's eyes in inches is its length in feet. —Joan Isbell, horticulturist, Ithaca, New York

Choosing a watermelon: A watermelon is ripe when you hear "punk" rather than "pank" or "pink" when you tap it with your finger.

—Paul Kastner, Nagano-Japan

Planning a massage: Plan on spending 1½ hours per full-body massage, plus an additional 5 minutes for each bad joke the client makes before the session. The number of bad jokes is directly proportional to the thickness of the body armor. —Jeanne Toma, massage therapist, Lebanon, New Hampshire

Saying things: If you find yourself thinking that something goes without saying, it is probably in the best interest of everyone involved to say it.

—William Krieger,
English Department Chairman,
Gig Harbor, Washington

Building an igloo: An igloo should be built in an area where the snow is packed just loose enough to make a footprint, but not so loose that it blows away in a high wind.

—Dennis Eskow,
science editor,
Popular Mechanics

Testing a direct mail campaign: For a reliable direct mail test, you should mail enough to get 300 responses. —Cathy Elton,
circulation manager,
American Demographics

Anticipating voter turnout: You need a 65 percent black population in an area to get a 50 percent black voter turnout. That's adding 5 percent for the younger age structure of the black population, 5 percent for under-registration of blacks compared to whites, and 5 percent for the fact that blacks are less likely to vote even if they are registered.

—Bill O'Hare, Joint Center for
Political Studies, Washington, D.C.

Throwing a knife: If your knife balances more than 1 inch from the tang on the handle side, it is handle heavy and should be thrown from the blade. Likewise, it if balances more than 1 inch from the tang on the blade side, it is blade heavy and should be thrown from the handle.

—Survivalist at a gun show,
Lansing, New York

Selling a new car: Your customer has decided to buy the car when he or she asks what colors are available. Stop selling and close the deal.

—Dirck Z. Meengs,
management consultant,
Canoga Park, California

Making hot fudge: Your hot fudge is ready when you can write your name in the surface with a spoon and it doesn't disappear before you finish writing. —Robin Masson,
attorney and law professor,
Ithaca, New York

Learning Algebra: Repeating Algebra I rarely raises the grade by more than one letter (C to B, D to C, etc.).

—R. C. Woods,
teacher, Miranda, California

Parking a car: When nosing your car close to a wall, turn on your high beams and watch the reflection on the wall as you slowly move closer. When the brightest part, the umbra, falls out of view, you are close enough. —Jon Roppolo, student,
Flushing, New York

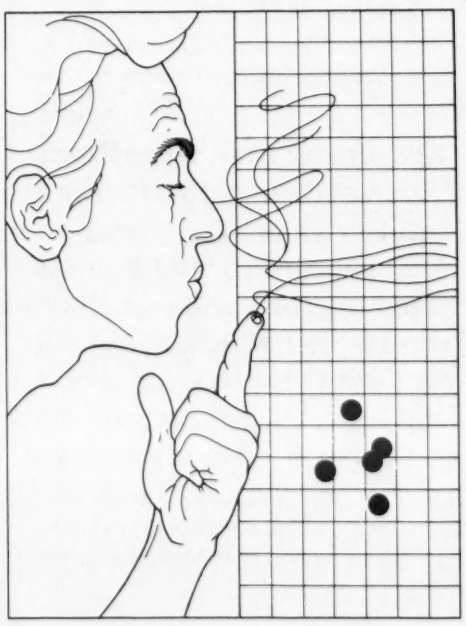
Screening for cystic fibrosis: Kiss your baby. If he or she tastes extremely salty, check with your doctor about getting further tests for cystic fibrosis.

—Tom Ferguson, M.D., Editor,
Medical Self-Care,
Inverness, California

Building a snow sculpture: The average crew of three will spend two hours building for every foot of snow sculpture.

—Mike McQueen, snow sculptor,
Winter Park, Colorado

Winning a duel: When dueling with firearms, always aim lower than your opponent's vital area—to pierce the heart, aim at the knees. —Jim Barber,
historian, Springfield, Missouri



Pouring milk for cereal: You have enough milk in your bowl when the edge of your pile of Cheerios first starts to move.

—Mike Rambo, photographer,
Ithaca, New York

Waiting in line: The number of minutes you will wait in line at a bank is equal to the number of tellers times 2.75.

—Chuck Davis, writer/broadcaster,
Surrey, British Columbia

Avoiding Lunatics: To avoid lunatics on city buses, sit in the middle of the bus. The friendly ones sit as close to the driver as they can and the unfriendly ones sit as far away as they can.

—Keith Allen Hunter,
computer operator, Denver, Colorado

Using robots: You need one robotics technician for every four industrial robots.

—Charles Stoehr,
robotics technician, Cincinnati, Ohio

Knocking away a gun: If an assailant is actually touching you with a handgun, you can knock it out of line before he or she can fire it.

—Leslie Simpson,
Wollaston, Massachusetts

Riding a bus: On a Greyhound bus, the side with the bathroom has more leg-room than the side with the driver.

—Neil Hess,
ski instructor, Syracuse, New York

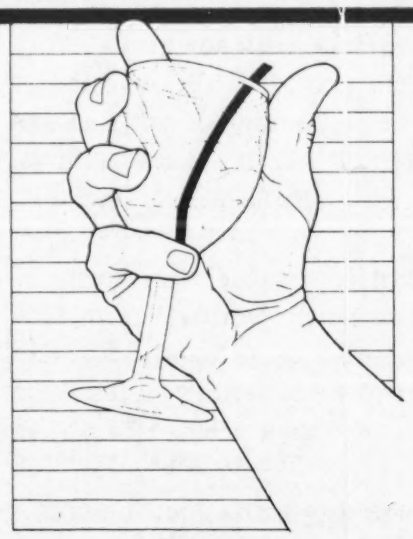
Loading a musket: In a pinch, the proper powder charge for a muzzle loading rifle or musket can be approximated by the amount that will just cover the ball when held in the hollow of your palm.

—Bob Chaney, Carlsbad, California

Counting bacteria: There are 1,000,000 bacteria per milliliter in the middle of an average lake or ocean. —David Glaser,
microbial ecologist,
Boston, Massachusetts

Getting letters: The response to a direct mail campaign peaks one week to ten days after you receive the first response.

—John Pitts, publicist,
Boston, Massachusetts



Testing a wine: Taste the second half of an open bottle of young white wine that has been in the refrigerator for a week and you will have some idea of how that wine will develop over time in your wine cellar.

—Craig Goldwyn, publisher, **International Wine Review**

Judging fireworks: Watch for color in fireworks, especially blue. If you see good blues, you are watching a top-notch fireworks display.

—Dr. John A. Conkling, American Pyrotechnics Association

Running an ad agency: One good writer can keep two good art directors busy.

—Robert L. Bishopric, advertising executive, Miami, Florida

Avoiding a helicopter: The dangerous gale-force rotorwash of a hovering helicopter extends outward to a distance three times the diameter of the main rotor.

—David A. Shugarts, editor, **Aviation Safety**

Drying your hands: If you are generally too busy to use hot-air hand dryers in public restrooms, your lifestyle is probably too busy for your own health.

—Gerald Gutlipp, mathematician, Chicago, Illinois

Pouring creamer in your coffee: If the creamer swirls up brown you have a cup of freshly brewed coffee. If it swirls up grey, the coffee has been sitting on the burner for too long.

—Rick Eckstrom, builder Danby, New York

Using graphite: If you are replacing an aluminum piece with graphite and you can't get at least a 40 percent weight reduction, there is something wrong with your design (or your calculations).

—Thomas E. Keavney, aeronautical engineer, Norwalk, Connecticut

Getting arrested: If you get arrested, and you did it, and it's your first offense, skip the lawyer, plead guilty, and take your fine and/or probation. You will save time and money and it's the best deal most attorneys can arrange.

—Carl Reddick, probation officer, Newport, Oregon

Using LSD: It takes ten years to recover from serious use of LSD.

—Leonard Cohen, poet and songwriter, quoted in **USA Today**

Making a fuse: If your car blows a wierd-looking fuse and you don't have a spare — one wrap of cigarette pack foil will give you a 20 amp fuse; two wraps will give you about 35 amps.

—Douglass A. Pineo, biologist and falconer, Pullman, Washington

Cutting your hair: People who wear short hairstyles will generally need a haircut within a week after their hair looks perfect.

—Ann Kimbrough, Blaine, Tennessee

Watching a movie: If you've heard of the stars of a new movie but you haven't heard about the movie itself, it's probably a stinker.

—Bruce Reznick, associate professor of mathematics, Urbana, Illinois

Showing stuffed tarantulas: When showing stuffed tarantulas in a glass case, two out of four people will find them interesting. One will completely refuse the invitation and one will want to inspect closely. All will initially recoil at the idea of the glass top being removed.

—Alan T. Whittemore, YMCA Physical Director, South Deerfield, Massachusetts

Predicting rain: If three women in a row check into the hospital with ruptured membranes, but not in labor, it is going to rain within 24 hours.

—Elizabeth Kasehagen, R.N., Santa Barbara, California

Call-in radio contests: You can expect ten call-in contestants for every dollar you are giving away.

—Don Burley, radio talk-show host, Kansas City, Kansas

Explaining mathematics: If you can't explain a mathematical theorem to a ten-year-old, you don't understand it yourself.

—G. S. Tahim, mathematician, Bloomington, Indiana

Restoring old motorbikes: Someone who says more than two or three sentences about their current restoration project is never going to finish it. Make them a decent offer in a year for the half-assembled wreck.

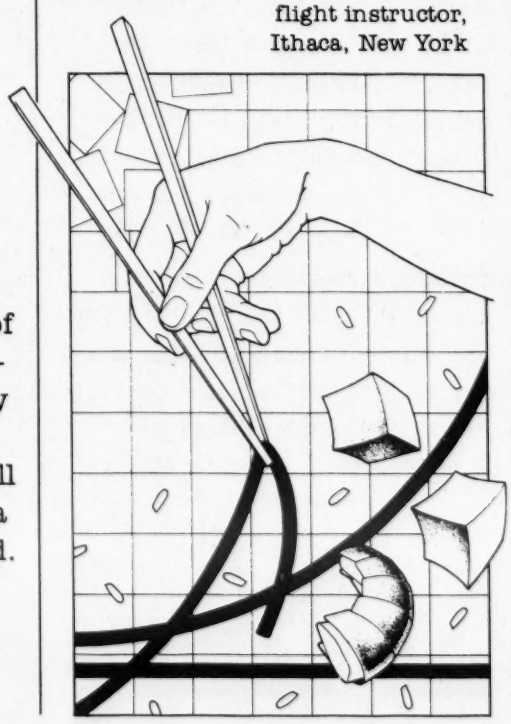
—Jake Williams Aberdeenshire, Scotland

Estimating time of death: To estimate the length of time a person has been dead, take the rectal temperature, and if it is above room temperature, subtract from 98. The answer is the number of hours since death.

—Thomas O. Marsh, coroner's investigator, Fairfield, Ohio

Making tofu: One pound of soybeans yields 2½ pounds of tofu.

—Rob Shapiro, flight instructor, Ithaca, New York

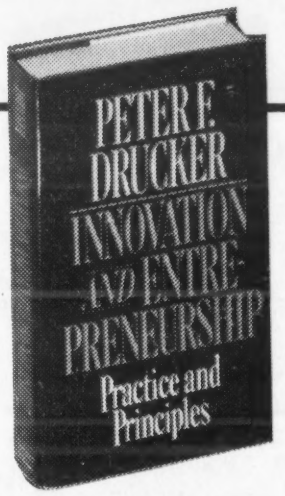


Innovation and Entrepreneurship

*Drucker makes a damned interesting case that we have become an Entrepreneurial Society and that it's saving our ass. According to long-term business cycles reliable in the past, the economy should be bleak right now. It's not. The sudden deluge of women into the work market should have mangled the employment situation. It didn't. What appears to be taking up all the slacks is an entrepreneurial zest and ferment unlike any in history, and it's being built into the society. Drucker, right on schedule, has written the handbook of entrepreneurial "practice and principles." There's a lot of such books these days. He blows them away. The all-time master of management (**Concept of the Corporation** was 1946, still in print) hasn't lost his touch.* —*Stewart Brand*

•

We are indeed in the early stages of a major technological transformation, one that is far more sweeping than the most ecstatic of the "futurologists" yet realize, greater even than *Megatrends* or *Future Shock*. Three hundred years of technology came to an end after World War II. During those three centuries the model for technology was a mechanical one: the events that go on inside a star such as the sun. This period began when an otherwise almost unknown French physicist, Denis Papin, envisaged the steam engine around 1680. They ended when we replicated in the nuclear explosion the events inside a star. For these three centuries advance in technology meant — as it does in mechanical processes — more speed, higher temperatures, higher pressures. Since the end of World War II, however, the model of technology has become the biological process, the events inside an organism. And in an organism, processes are not organized around energy in the physicist's meaning of the term. They are organized around information.



Innovation and Entrepreneurship
Peter F. Drucker
1985; 277 pp.
$19.95
($21.45 postpaid) from:
Harper and Row
Keystone Industrial Park
Scranton, PA 18512
or Whole Earth Access

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Entrepreneurship rests on a theory of economy and society. The theory sees change as normal and indeed as healthy. And it sees the major task in society — and especially in the economy — as doing something different rather than doing better what is already being done. This is basically what Say, two hundred years ago, meant when he coined the term *entrepreneur.* It was intended as a manifesto and as a declaration of dissent: the entrepreneur upsets and disorganizes. As Joseph Schumpeter formulated it, his task is "creative destruction."

•

Specifically, systematic innovation means monitoring *seven sources* for innovative opportunity.
- *The unexpected* — the unexpected success, the unexpected failure;
- *The incongruity* — between reality as it actually is and reality as it is assumed to be or as it "ought to be";
- *Innovation based on process need;*
- *Changes in industry structure or market structure* that catch everyone unawares;
- *Demographics* (population changes);
- *Changes in perception, mood, and meaning;*
- *New knowledge,* both scientific and nonscientific.

Handbook for Effective Global Action

The last few years have seen a plethora of books and publications advocating peace, nuclear disarmament, and economic justice for the Third World. What makes this handbook stand out is its nuts-and-bolts approach. Forty-five specific initiatives and sixty supporting actions are spelled out, along with practical steps that can be taken by individuals to push things along.

Granted, most of those steps and actions boil down to lobbying specific governments and world leaders in the interest of the proposals noted in the book. However, following the guidelines provided, there's a better chance that some good might come of it than if one were to blindly flail about sending well-meaning letters into the void. Even if you don't agree 100 percent with every initiative presented here (most of which can be characterized as supporting peace, the U.N., and international cooperation), there is still much to learn from the lobbying strategy that is articulated. —*Jay Kinney*
[Suggested by Pamela Graham]

•

Lobbying Foreign Governments.
1. Remember, that *world public opinion* is the most powerful tool we have at this time, to impact on global problems. *We are each an essential part of world public opinion.*

2. *Letter writing can have an important effect.*

3. *It is important to speak to the specific concern and motivation of the person you are addressing.* If you know that that person is most concerned with keeping his or her job, show how certain decisions and actions can solve issues that they are working on, get the job done, satisfy those on whom they depend, etc. If the person is clearly moved by the plight of other people, then show how a certain approach can alleviate that. Remember they are individuals in their own right. They do not necessarily share your motivations and will therefore not always be able to relate to what motivates you. *They will respond if their own concerns are addressed.*

4. *Speak to the best sides of people.* Write polite letters, show confidence in their desire to do right by others, to make positive changes, to abide by international agreements, etc. We shall go into this in more detail below.

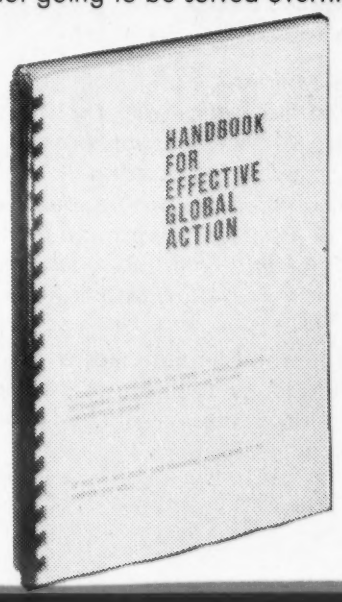
5. *Give your communications a narrow and pointed focus.* Write about one issue at a time, a specific case, a specific action.

6. *Mention facts where you can.* They add substance and speak more loudly than opinions and theories, which are less immediate.

7. *Make an impact by using any support you can muster.*

8. *Keep yourself motivated.* Use this lobby to promote those objectives you are personally most moved by and most interested in achieving. Follow the spark of your interest. Do not force unrealistic action schedules on yourself. Use them wisely to keep yourself on track and to safeguard against momentary whims.

9. *Do not give up.* Remember that global problems are not going to be solved overnight.

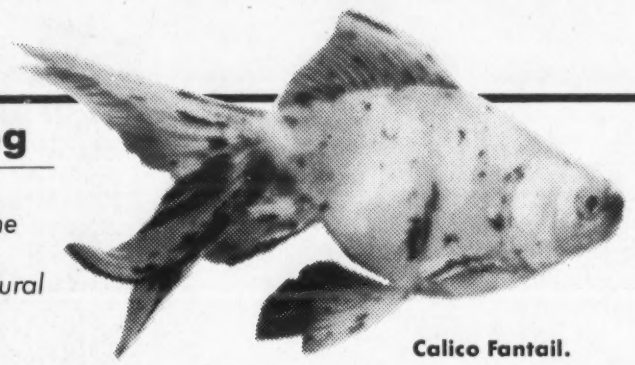


Handbook for Effective Global Action
Elisabeth A. Ulatowska,
1985; 130 pp.
$15
postpaid from:
Handbook for Effective Global Action
150 Bret Harte Street
Berkeley, CA 94708
or Whole Earth Access

Lilypons Water Garden Catalog

Some hungry biographer is going to break into the literary world with an astonishing fictional report of the five years Claude Monet spent painting "Monet was here" in the shape of 300 acres of aquatic farms in rural Maryland and Texas, home of Lilypons.

It will come as no surprise because Lilypons Water Gardens offers a fantastical palette of hardy and tropical water lilies, lotus, bog flowers, irises, as well as oxygenating plants, ornamental fish, statuary, and fountains by mail. Not to mention any and all practical paraphernalia that bring Monet's floating worlds back home: pool liners, pumps, fittings, filters — the whole works. Just add water. —Jane Seitz



Calico Fantail.

Lilypons Water Gardens
Catalog
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OUR BABY COLLECTION (G-125)
Fifteen beautiful babies for a small pool, representing five different varieties.

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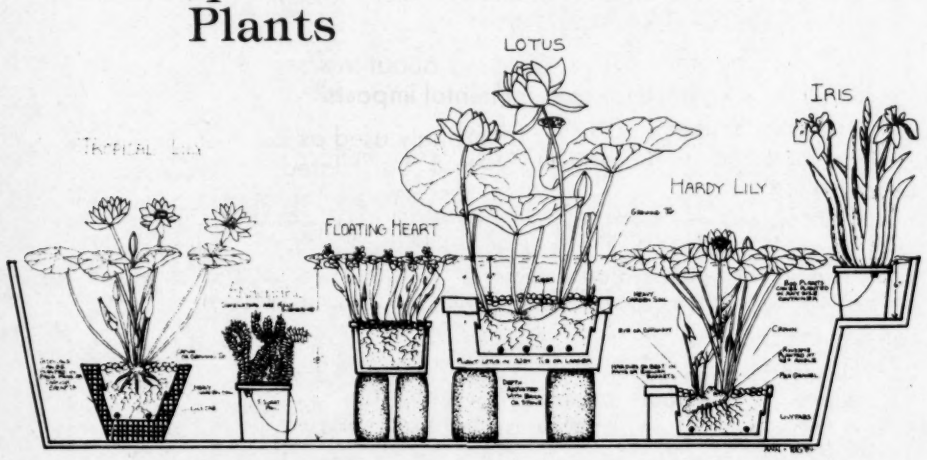
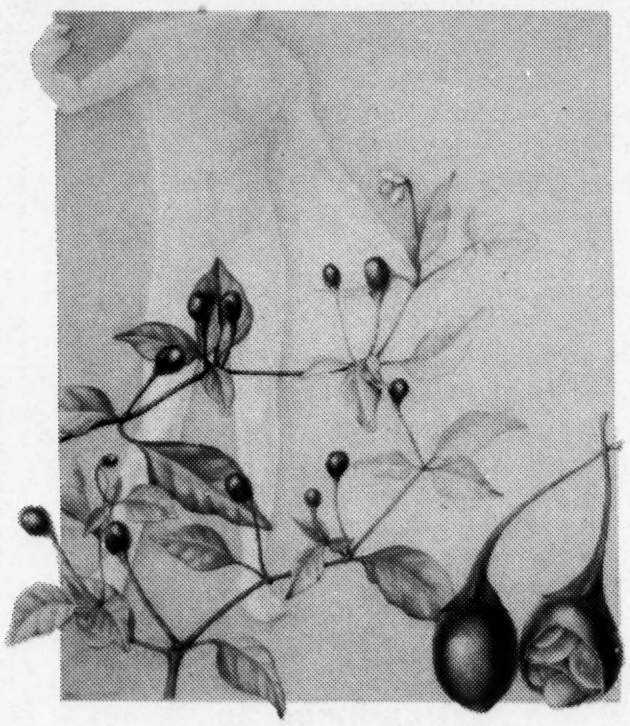
ALBA GRANDIFLORA (*Nelumbo nucifera* 'Alba Grandiflora.') Large, rounded white petals. Zone 5-9. $30.



Alba Grandiflora.

Gathering the Desert

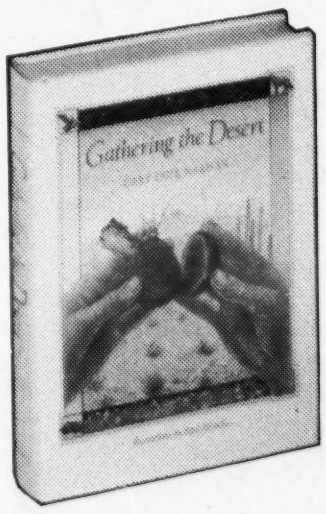


"He presented himself at the table . . . reached down, and his testes turned into chile pods. He began to sprinkle their spice into all the foods."

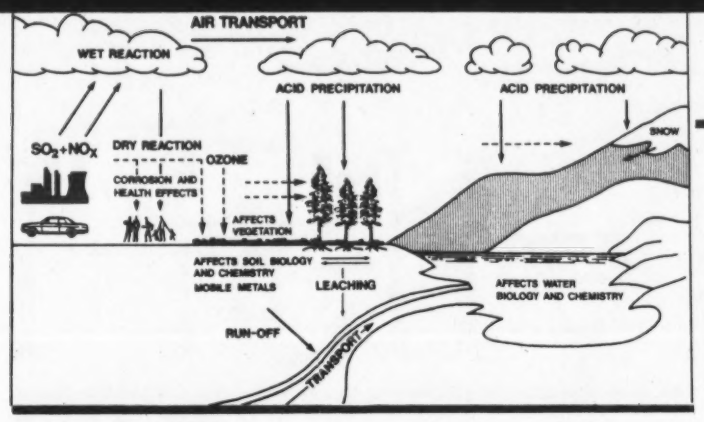
Gary Nabhan continues his exploration of the ethnobotany of the Sonoran Desert that began with ***The Desert Smells Like Rain*** *(**CQ** #37, p. 26). Twelve plants are discussed with the aim of conveying the personality each possessed for the Indians whose cultures once depended on them. This gentle blend of history, scholarship and country yarns makes for a book that entertains while it teaches.* —Richard Nilsen

•

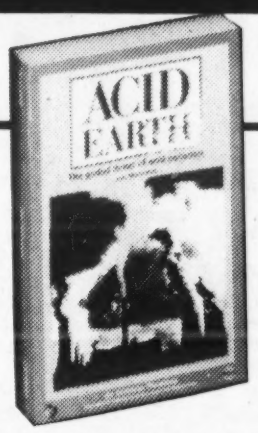
Wild chiltepines must have more of what makes chiles holy than your normal, average, everyday farm-dwelling green or red pepper. This spiritual essence of chile is an odorless, colorless, flavorless non-nutrient that a chemist named Thresh first crystallized and described as *capsaicin* late in the nineteenth century. Thresh correctly guessed that this fat-soluble compound is structurally similar to vanilla. By the 1920s, when Nelson first artificially synthesized capsaicin, chemists realized that any of a number of acid amines with basic vanillylamine units could stimulate pain receptors in the human mouth. Wild chiltepines have as much as four times this pungency principle per unit weight than do larger, domesticated chile varieties. In the definitive survey of the most pungent varieties of the chile genus, wild Mexican chiltepines topped even the Japanese *santaka*, the fire-breathing dragon of the introduced Asian chiles. Human senses can detect capsaicin in dilutions of one part in 15 million, and chiltepines have as much as 2,600 parts capsaicin per million of them. From a quick calculation, you can project that a bite into a chiltepin is 39,000 times more powerful than what it needs to be for your taste buds to tell you that you are eating a chile! In short, the chiltepin, as progenitor to most cultivated chile varieties, is the hottest mother around.



Gathering the Desert
Gary Paul Nabhan
1985; 209 pp.
$19.95
($20.95 postpaid) from:
University of
Arizona Press
1615 East Speedway
Tucson, AZ 85719
or Whole Earth Access



Acid Earth
John McCormick
1985; 190 pp.
$6.26 from:
Earthscan Washington
1717 Massachusetts
Avenue NW
Washington, DC 20036



Acid Earth

This world-wide view of acid deposition is tersely written and not comforting, but it will make ideal reading for anyone convinced that nuclear proliferation is the only problem worth worrying about. We are pickling ourselves globally with the byproducts of our technological wastes. I recall this from Paul Ehrlich at a conference a couple of years back: "If you had asked me 20 years ago, what one thing could you do to the earth to best destroy life, I would have gone home, thought about it and come back and said, 'Pour a dilute solution of acid over it.'" Well, it's happening — on your windowsill and the top of the Rocky Mountains and clear to the North Pole.

It's a problem that is not about to change until people understand the situation and demand change. ***Acid Earth*** *has country-by-country status reports and enough basic explanation to get anybody started down the road toward a solution.* —*Richard Nilsen*

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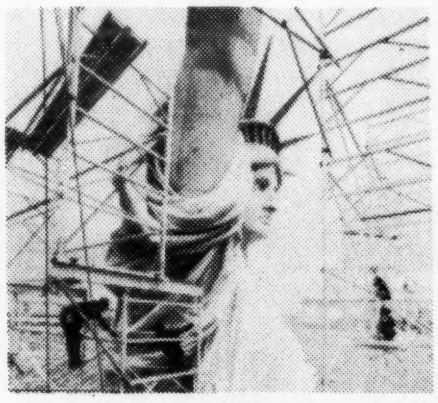
That certain kinds of air pollution produce wet or dry acid deposition is no longer seriously disputed. That the combustion of fossil fuels is the major source of the pollution is agreed. That a variety of emission control technologies are available is well-known. But the effects of acid pollution — and the relative role of other factors, especially in forest dieback and surface water acidification — are still hotly debated. And the precise mechanisms by which these pollutive effects are achieved are still unclear, raising inevitable questions about the best way of preventing harmful environmental impacts.



Acid corrosion. In 1984, the Statue of Liberty was partly dismantled for restoration. Nearly a century in the polluted air of New York City had severely corroded its iron frame and copper cladding.

• 'Acid rain' is indiscriminately and wrongly used as a blanket term to describe several different (but related) forms of air pollution associated with the combustion of fossil fuels.

• The interest in SO_2 has until recently drawn attention away from the role of nitrogen oxides, ozone and other pollutants.

• The obsession with acid damage in western Europe and eastern North America has obscured the almost universal threat of acid pollution. It is a real or potential problem almost wherever fossil fuels are burned in any quantity.

Struggle for Space

It's always striking to see anything growing in the concrete canyons of New York City, not to mention the rubble of a place like the South Bronx. In the middle of an unrivaled density, open space is a sanctuary of sanity.

New York City's brush with bankruptcy meant all open living spaces from street tree spots to major parks lost most of their municipal support. This led to decreased maintenance and increased neglect and vandalism. The overall effect was a drastic erosion of quality and quantity of open space.

Struggle for Space *is the story of the people who put together a major grass-roots effort to save not only open space but also the city's overall quality of life. It shows how and why traditional mechanisms for park maintenance and development no longer apply to urban centers.*

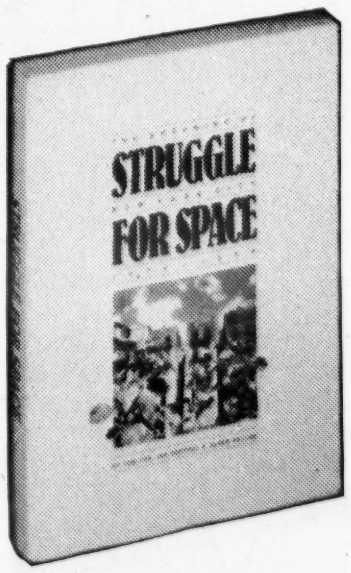
It is a heartening story of people and neighborhoods getting things done in creative participatory ways. The enthusiasm of the authors comes across well. It is useful reading for anyone concerned with urban open spaces including parks, community gardens and even street trees. —*Shane Smith*

•

The growing number of city farmers harvesting bushels of vegetables from the city soil raised increasing concern and controversy over the subject of heavy metal contamination. Heavy metals are a distinct class of elements which include lead, cadmium, nickel, mercury, and zinc, all of which abound in the urban environment. Their primary source is automobile exhaust, as well as industrial emissions and demolished city buildings. . . .

In fact sheets compiled by the Green Guerillas, prospective gardeners were told to have their soil tested free of charge by Cornell Extension. They were also given suggestions on using ornamental vines to screen their gardens from traffic, and other techniques to reduce the possibility of heavy metal buildup in the soil. City dwellers, eager to get their hands in the soil, could be assured that good gardening was possible without fear of heavy metal contamination.

Struggle for Space
Tom Fox, Ian Koeppel and Susan Kellam
1985; 165 pp.
$15
($16 postpaid) from:
Neighborhood Open Space Coalition
72 Reade Street
New York, NY 10007
or Whole Earth Access



A LESSON FOR THE MODERN WORLD

AMISH

by Gene Logsdon

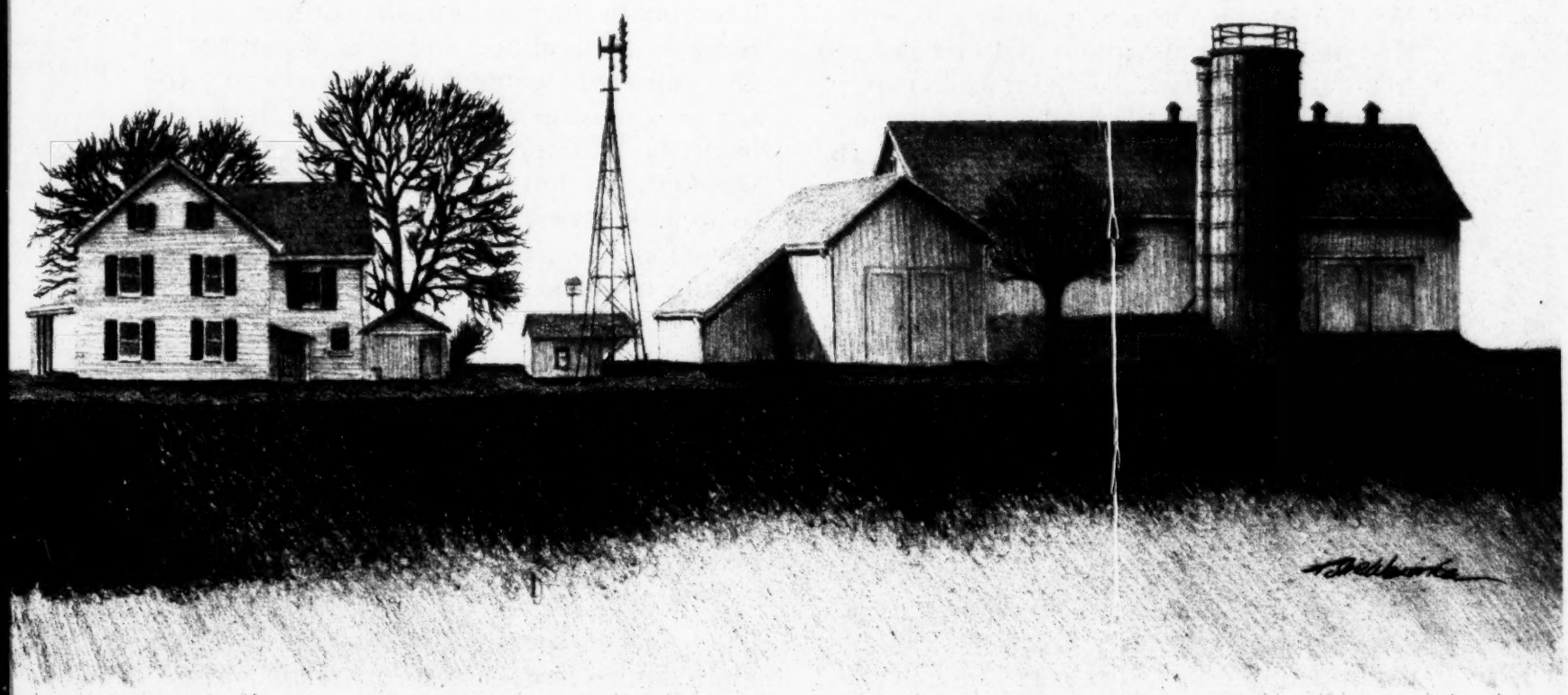
illustrations by Julie Wawirka

THE AMISH HAVE BECOME A GREAT embarrassment to American agriculture. Many "English" farmers, as the Amish call the rest of us, are in desperate financial straits these days and relatively few are making money. As a result it is fashionable among writers, the clergy, politicians, farm machinery dealers and troubled farm banks to depict the family farmer as a dying breed and to weep great globs of crocodile tears over the coming funeral. All of them seem to forget those small, conservatively-financed family farms that are doing quite well, thank you, of which the premium example is the Amish.

Amish farmers are still making money in these hard times despite (or rather because of) their supposedly outmoded, horse-farming ways. If one of them does get into financial jeopardy, it is most often from listening to the promises of modern agribusiness instead of traditional wisdom. His brethren will usually bail him out. More revealing, the Amish continue to farm profitably not only with an innocent disregard for get-big-or-get-out modern technology, but without participation in direct government subsidies other than those built into market prices, which they can't avoid.

I first learned about the startlingly effective economy of Amish life when I was invited to a barn raising near Wooster, Ohio. A tornado had leveled four barns and acres of prime Amish timber. In just three weeks the downed trees were sawn into girders, posts, and beams and the four barns rebuilt and filled with livestock donated by neighbors to

ECONOMICS



replace those killed by the storm. Three weeks. Nor were the barns the usual modern, one-story metal boxes hung on poles. They were huge buildings, three and four stories high, post-and-beam framed, and held together with hand-hewn mortises and tenons. I watched the raising of the last barn in open-mouthed awe. Some 400 Amish men and boys, acting and reacting like a hive of bees in absolute harmony of cooperation, started at sunrise with only a foundation and floor and by noon, *by noon*, had the huge edifice far enough along that you could put hay in it.

A contractor who was watching said it would have taken him and a beefed-up crew all summer to build the barn if, indeed, he could find anyone skilled enough at mortising to do it. He estimated the cost at $100,000. I asked the Amish farmer how much cash he would have in the barn. "About $30,000," he said. And some of that paid out by the Amish church's own insurance arrangements. "We give each other our labor," he explained. "We look forward to raisings. There are so many helping, no one has to work too hard. We get in a good visit." Not the biggest piece of the Rock imaginable carries that kind of insurance.

Not long afterwards, I gave a speech to an organization of farmers concerned with alternative methods of agriculture in which I commiserated at length with the plight of financially depressed farmers. When my talk was over, two Amish men approached me, offering mild criticism. "We have just finished one of our most financially successful years," one of them said. "It is only those farmers who have ignored com-

I used to live close enough to the Amish to occasionally meet them. I came away from each encounter feeling they knew more about how to live well than I did. That benevolent suspicion is quantified by Gene Logsdon, whose notetaking is mindfully done with hands callused by his own mixed-stock small farm. Mr. Logsdon raises corn, oats, wheat, hay, chickens and sheep on a miniature model of a 1940s farm in Upper Sandusky, Ohio. Been at farming 30 years or so. —*Kevin Kelly*

Amish farming is better than expert farming by about $150 an acre.

mon sense and tradition who are in trouble." What made his remarks more significant is that he went on to explain that he belonged to a group of Amish that had, as an experiment, temporarily allowed its members to use tractors in the field. He also was making payments on land that he had recently purchased. In other words, he was staring at the same economic gun that's pointed at English farmers and he was still coming out ahead. "But," he said, "I'm going back to horses. They're more profitable."

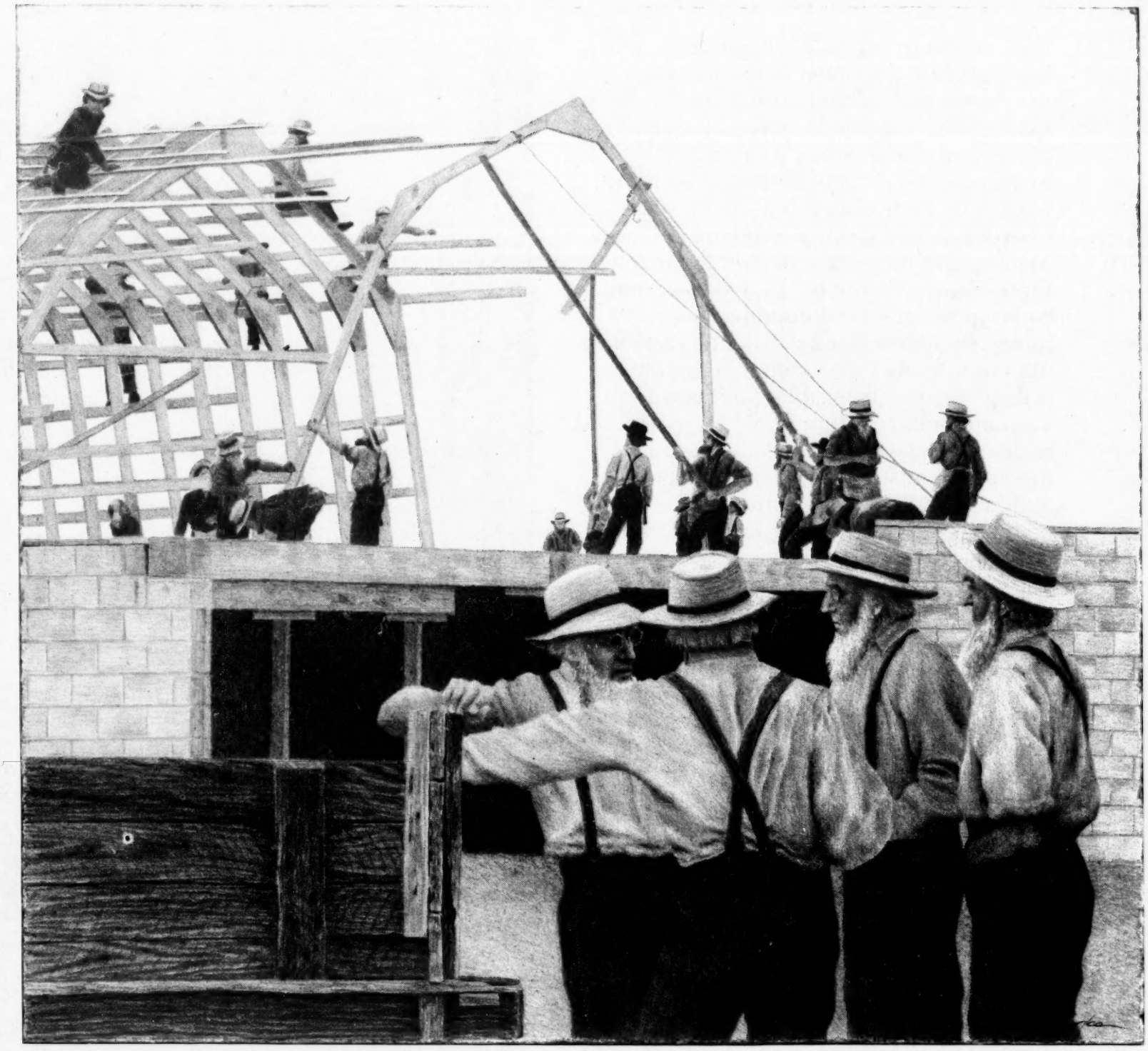
From then on, I resolved to start cultivating the Amish as assiduously as they cultivated their fields. I had always taken our sorghum to Joe Bontragger's press in the Kenton, Ohio area not far from our farm. We bought bulk foods and angelfood cake at the Peterscheims', and sought advice about operating a woodworking shop at Troyers', but now I expanded my horizons to include eastern Ohio, center of the largest Amish community in the world. When I helped a neighbor haul hay to that area, I received another lesson in Amish economics. If they need to buy extra feed for their livestock, they almost always choose to buy hay and raise the grain rather than vice versa. The price of the hay is partially regained as manure after it passes through the livestock since it allows them to cut down on the amount of fertilizer they need to buy. The greater mass of hay generates a greater mass of manure, adding organic matter to the soil. That is valuable beyond computer calculation. Grain farmers in my area who sold their straw and hay to the Amish were trading their soil fertility for cash of flitting value.

Whenever I got to know an Amish farmer well enough, I asked about farm profits. Always the answer was the same, spoken with careful modesty. Not as good as in the '70s, but still okay. I heard that in 1983, '84, and even '85, when finally the agribusiness magazines admitted that agriculture faced a fullblown crisis.

Eventually, or perhaps inevitably, I took my softball team to Holmes County for a cowpasture doubleheader with neighborhood Amish players organized by David Kline, Abe Troyer and Dennis Weaver, among others. It was a grand day. We were perhaps a run better than the Amish, but they were twice as adept at dodging piles of manure. Our collected "womenfolk" cheered from the shade. The Amish bishop watched from his buggy behind home plate, sorely tempted, I was told, to join the game but afraid it might seem a bit demeaning to some of his congregation. The games themselves taught two lessons in economy. First, our uniforms of blue and gold cost me more money than I care to talk about. The Amish players, with their traditional denims, broadcloth shirts and straw hats, are always in uniform. Second, some of our player/farmers could not take time off from their high-tech machines to play in the game. The Amish, with their slow, centuries-old methods, had plenty of time.

The games became prelude for discussions about Amish farm economy, since some of our players were farmers also. But long before these post-game discussions took place, Henry Hershberger taught me the deeper truth and wisdom of Amish economy. Hershberger is a bishop in the Schwartzentruber branch of the Amish, the strictest of the many sects. I went to visit Hershberger in 1983 because he had just gotten out of jail, which seemed to me a very curious place for an Amish bishop to be. Hershberger had been in jail because he would not apply for a building permit for his new house. Actually, he told me (in his new house), it was not the permit or building code regulations that got him in trouble with the law. He groped for the unfamiliar English words that would make the meaning clear. Most Amish can't meet certain requirements of the code because of religious convictions. But there is an understanding. The Amish buy the permit, then proceed to violate its rules on details, of lighting and plumbing or whatever, that their religion disallows. The authorities look the other way.

Hershberger had given that practice considerable thought. Not only did it smack of dishonesty but, he realized with the wisdom of 400 years of Amish history that had survived more than one case of creeping totalitarianism, at any time the authorities could



decide to enforce the letter of the law. This was particularly worrisome because it would mean greatly increased costs of construction, if indeed some way to get around the religious problem were found. But more importantly, it could mean, with the way the permit business is being handled, that authorities might someday stop Amish from building more houses on their farms. So Hershberger refused to play the game. The bureaucracy was ready to accommodate Hershberger's religion since it is common knowledge that the Amish build excellent houses for themselves — they would be fools not to, of course — but for Hershberger not to offer token obeisance to bureaucracy was unforgivable. That might lead, heaven forbid, to other people questioning the sanctity of the law.

Taken to court, Hershberger was found guilty and given 30 days to pay up and get his permit. He refused. The judge, underestimating the resolve of a Schwartzentruber bishop, fined him $5,000. Hershberger refused to pay. The judge sent him to jail to work off his debt at $20 a day. A great public hue and cry arose. In two weeks Hershberger was set free, still owing the court $4,720. The sheriff was ordered to sieze enough property to satisfy the debt. But local auctioneers said they would not cry the sale. No one would haul the livestock. The judge resigned (for other reasons, I was told). Henry Hershberger lives in his new house, at peace, at least for now.

The flood of letters in the Wooster paper over the event became a community examination of conscience. At first the debate centered on the question of "the law is the

law" versus freedom of religion. But slowly the argument got down to the real issue of the permit law: Where does it lead? Who in fact is being protected? Henry Hershberger's contention that building permits can be used to keep housing out of certain areas if the powers on high want it that way is common knowledge: you just make the soil percolation requirement more rigid or start enforcing those already on the books. Nor do building codes guarantee good buildings, as every honest builder will tell you. Codes establish minimum standards which then become ceilings on quality, enabling minimum-standard builders to underbid high-standard builders, encouraging the latter to follow the minimum standards, too. Furthermore, building regulations are rather easily outmaneuvered, glossed over, and bribed away, if the rewards are high enough. Often building codes prevent people from building their own homes for lack of proper certification or a supposedly proper design. Building codes protect not the buyer but the builders, the suppliers of the approved materials, and an army of career regulators. The Amish understand all this. When a culture gives up the knowledge, ability and legality to build its own houses, the people pay. And pay.

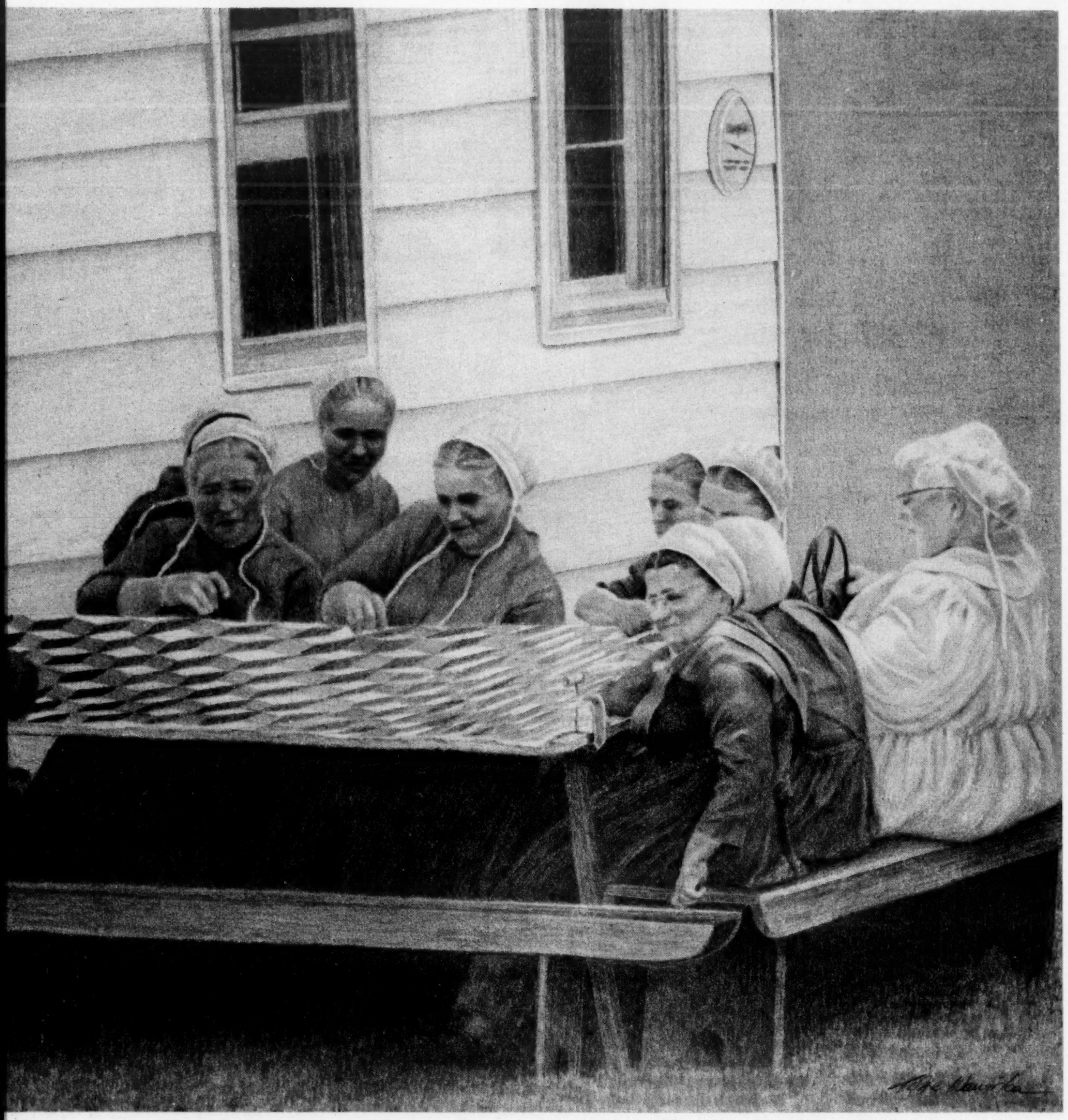
But there are even more practical reasons why the Amish economy wants to retain control over its housing. First of all, the Amish home doubles as an Amish church. How many millions of dollars this saves the Amish would be hard to calculate. Amish belief wisely provides for the appointment of ministers by lot. No hierarchy can evolve in Amishland. A minister works his farm like everyone else. That is mainly why the religion so effectively protects the Amish culture of agriculture. Its bishops do not sit in exceedingly well-insulated houses in far-off cities uttering pious pronouncements about the end of family farming.

Secondly, the Amish home doubles as the Amish retirement village and nursing home, thereby saving incalculably more millions of dollars, not to mention the self-respect of the elderly. The Amish do not pay Social Security, nor do they accept it. They know and practice a much better security that requires neither pension nor lifelong savings.

There is an old Amish quiltmaker who lives near Pffeifer's Station, a crossroads store and village I often frequent. Her immediate family is long gone and she lives now with somewhat distant relatives who, being nearest of kin, are pledged to care for her. Her quarters are a wee bit of a house connected to the main house by a covered walkway. I make

up excuses to visit, pretending to be interested in quilts. I have no idea how old she is, other than ancient.

Around her I feel the kind of otherworldly peace I used to feel around nuns before they decided to dress up and hustle about like the rest of us. Her bedroom is just big enough for a bed and quilting frame; her kitchen equally tiny. The boys of the family keep the walkway stacked with firewood for her stove. She has her own little garden. Children play on her doorstep.



She has her privacy but surrounded by living love, not the dutiful professionalism of the old folks' home. And she still earns her way. Quilt buyers come, adding to her waiting list more quilts than her fingers, now slowed by arthritis, can ever catch up with. But when she puts down her Bible to dicker over price, she is as canny a businesswoman as any.

I love that scene. She still lives in the real world. If she were not Amish, she would have languished in some nursing home and no doubt be dead by now — from sheer boredom if nothing else.

Between the ballgames, sorghum pressings and barnraisings, I have had the chance to observe several Amish households enough to know that there are few generalities. The Herschbergers of the Schwartzentruber Amish, the Bontraggers and all who live near Kenton, Ohio, and the Holmes County neighborhood where we played softball, all represent different economic levels. I do not

wish to say that one is financially better off than another, because I do not know. But compared to a middle-class English household, the Hershbergers have the fewest amenities — not even a soft chair, although there is a beautiful, century-old pendulum clock on the wall. The nearby Kenton community is more "advanced" compared to the Herschbergers'. The Holmes County houses are quite like our own except for the lack of electricity. These latter houses sport gas appliances, modern bathrooms, Maytag wringer washers with Honda gasoline motors (the Amish housewives say Hondas start easier than Briggs & Stratton). Though I saw none in the homes I visited, some Old Order Amish are allowed to use battery-operated kitchen mixers and the like — even battery-operated electric typewriters! Though there is something of a lack of interior decoration as we would call it (unless you go in for the country-look craze), any middle-class American could move into one of these Holmes County homes and not feel materially deprived until habit called for television, radio, or record player.

There are no telephones in the homes, but the Amish use the telephone booths that dot the roadsides. An Amishman views a telephone wire into the home, like an electric line, as an umbilical cord tying it to dangerous worldly influences. You will not talk so long or so often at a pay booth down the road.

Whatever one's view of such fence-straddling religious convictions, they obviously reveal tremendous economizing. In a 1972 study of Illinois Old Order Amish similar to the Holmes County Amish, conducted by the Center for the Biology of Natural Systems at Washington University in Saint Louis, Amish housewives said they spent $10 to $15 a week on food and non-food groceries. They reported household living expenses from $1,379 for a small, young family up to $4,700 for a large, better-financed one. My own Amish informants thought that today, that figure might top out at $8,000 for a large family, including transportation by buggy and occasionally renting a car or riding a bus. A horse and new buggy cost about $2,000 and last a good bit longer than a $12,000 car. Throughout Amish country in eastern Ohio, a vigorous small business has grown up taxiing Amish around in vans,

successfully competing with older private bus lines that perform the same service at a higher price. Clothing is a low budget item for the Amish as they use long-wearing fabrics and often sew the clothes themselves. Styles do not change.

Another surprising element in the Amish economy is the busy social life they lead within a day's ride by buggy or bicycle. We could scarcely schedule a softball game because there was always a wedding, a raising, a sale, a quilting, or church and school doings to attend! I can assure the world that the Amish have just as much fun as anyone, at far less than the cost of weekends made for Michelob.

Medical costs are the only expenses the Amish cannot control by their sub-economy. Religion forbids education beyond the early teens so they cannot generate their own doctors and medical facilities, and must pay the same ridiculous rates as the rest of us.

It is in agriculture that the Amish raise economy to a high art. After the ballgames, when talk got around to the hard times in farming today, the Amish said a *good* farmer could still make a good living with a herd of 20 to 25 cows. One of our players countered with mock seriousness: "Don't you know that you need at least 70 cows to make a living these days? Ohio State says so." "Oh my," an Amish dairyman replied, not entirely in jest, "If I could milk 70 cows, I'd be a millionaire." The Amish farmers all agreed that with 20 cows, a farmer could gross $50,000 in a good-weather year, of which "about half" would be net after paying farm expenses including taxes and interest on land debt if any. Deducting $8,000 for family living expenses still leaves a nice nest egg for emergencies, bad years and savings to help offspring get started in farming. Beginning farmers with higher interest payments than normal often work as carpenters or at other jobs on the side. These income estimates agree closely with those in the Washington University study mentioned above and those Wendell Berry reports in *The Gift of Good Land* (*WER* #33, p. 46), a book that demonstrates the sound fiscal foundation of small-scale, traditional farming, even — or especially — in a modern world.

Because my softball players shook their heads in disbelief at these figures, I asked one of the Amish farmers to compare his costs for producing a corn crop of 150 bushels per acre (his excellent yield in '84 and '85) with the 1984 Ohio State budget estimates as published each year by the state extension service. He returned the budget to me by mail with his figures. The first column of figures represents OSU's estimated typical cash grain farmer's cost per acre; the second, the Amish farmer's. I have added footnotes.

Item	1	2
Variable costs:		
Seed	$ 24.00	$ 18.66
Chemical fertilizer	63.00	9.10
Lime	8.00	5.06
Pesticides/herbicides	28.00 [1]	2.50
Fuel, grease, oil	19.00	3.00 *
Corn drying, fuel, electric	23.00	0.00
Trucking, fuel only	3.00	0.00
Repairs	13.00	.25 *
Misc. supplies, utilities, soil tests, small tools, crop insurance, etc.	13.00	.50 *
Interest on operating capital	12.00	.00
Fixed costs:		
Labor	9.00	0.00 [2]
Machinery charge	50.00	5.00 [3]
Land rental charge	110.00	0.00 [4]
Management charge	18.00	0.00 [5]
Total	$ 393.00	$ 44.07

* estimated.

1. Herbicide cost can be twice that or more if an application has to be repeated. Dennis Weaver, one of the Amish ballplayers, told me his herbicide cost was $14. "An acre?" I asked. "No," he replied. "Altogether."

2. The Amish farmer explains that he hires no labor and considers his own as part of the profit, not of the cost.

3. The Amish farmer said he didn't know exactly how to figure this because his machinery was so old it was "actually gaining in value now." His estimate is probably high. An Amish corn harvester, pulled by horses and powered by a Wisconsin 16HP motor, might cost $3,000 but likely half that. A typical agribusiness corn harvester costs over $100,000.

4. If you don't rent land, this item is called cost of ownership. The Amishmen say owning the land is a reward, not a cost.

5. "What does this mean?" the Amishman wrote. "Is this time spent asking experts how to farm?" Again he figures this as part of his salary, not a cost.

According to Ohio State experts, with the price of corn reckoned at $2.40 a bushel (lower now) a non-Amish farmer would gross $360

Amish do not work as hard, physically, as I did when my father and I were milking 100 cows with all the modern conveniences.

per acre against $393 in operating expenses for a net loss of $33 per acre, leading one farmer to comment, "It's a damn good thing I don't have a bigger farm." Meanwhile the Amish would realize a net profit of about $315 per acre. Even if you allow fixed costs in English accounting, Amish farming is better than expert farming by about $150 an acre. Just as important, the Amish seldom sell grain, but feed it to livestock and sell milk, meat, eggs, etc., thus retaining an even greater share of their profit dollar.

I told my Amish source he needed to add the cost of cultivating weeds out of the corn rows. He thought another dollar or two per acre would cover that, with horse cultivating. And, I added, he needed to add the cost of hauling all that manure to the fields. His response was a classic lesson in biological economy. "When I'm hauling manure, should I charge that to cleaning out the barn which keeps the cows healthy, or to fertilizing the field which reduces the fertilizer bill and adds organic matter to the soil, which in turn helps it to use soil nutrients more efficiently and soak up rain better to reduce erosion? How much do you charge for that in your computer? Or maybe I should charge manure hauling to training the young colt in the harness or giving winter exercise to the older horses. Or maybe deduct manure from machinery wear because the ground gets mellower with manure and is easier to work. I don't know how to calculate all that *accurately* on a farm."

The most amazing part of the Amish economy to me is that, contrary to notions cherished by old farm magazine editors who escaped grim childhoods on 1930s farms for softer lives behind desks, the Amish do not work as hard, physically, as I did when my father and I were milking 100 cows with all the modern conveniences in the 1960s. English farmers like to make fun of the Amish for their hair-splitting ways with technology — allowing tractors or engines for stationary power tools but not in the fields. But in addition to keeping the Amish way of life intact, such compromises bring tremendous economy to their farming while lightening the workload. A motor-powered baler or corn harvester, pulled by horses ahead of a forecart, may seem ridiculous to a modern agribusinessman, but it saves thousands of dollars over buying tractors for this work. The reason tractors aren't allowed in the fields is that they would then tempt an Amishman to expand acreage, going into steep debt to do so, and in the process drive other Amish off the land — which is exactly why and how American agriculture got into the trouble engulfing it today.

To satisfy religious restrictions, the Amish have developed many other ingenious ideas to use modern technology in economizing ways. Other farmers should be studying, not belittling, them. When Grade A milk regulations forced electric cooling tanks on dairymen, the Amish adopted diesel motors to generate their own electricity for the milk room, cooler and milk machines. They say it's cheaper than buying electricity and keeps them secure from power outages. Similarly, they operate commercial woodworking and other shops with diesel-powered hydraulic pumps rather than individual electric motors for each tool. Their small woodworking shops, like their printing and publishing houses and a lot of other enterprises, make money where others so often fail.

Where Amish are active, countryside and town are full of hustling shops and small businesses, neat homes, solid schools and churches, and scores of roadside stands and cheese factories. East central Ohio even has a small woolen mill, one of the few remaining in the country. Compare this region with the decaying towns and empty farmsteads of the land dominated by large-scale agribusiness. The Amish economy spills out to affect the whole local economy. Some farmers, like Lancie Cleppinger near Mount Vernon, have the great good sense to farm like the Amish, even though they don't live like them. They enjoy profits too. When discussing the problems agribusiness farmers have brought on themselves, Cleppinger just keeps shaking his head and repeating, "What in the world are they thinking?" The Amish sum it up in a sentence. "Don't spend more than you make and life will be good to you." Uncle Deficit should be so wise. ■

The Eleventh Commandment

Access to Christian environmentalism

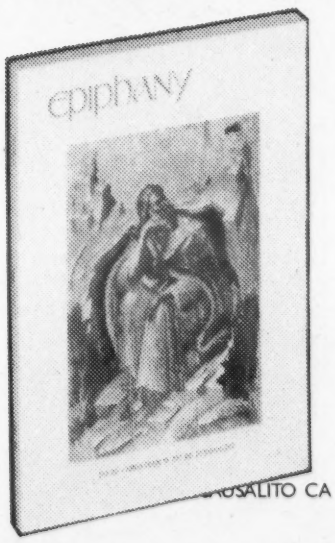
*It has been fashionable to blame our Judeo-Christian ancestry for our woeful behavior toward Gaia. Outrageous figures like James Watt convinced most people that good Christians believed they were obliged to loot the Earth. All the while a congregation of believing environmentalists has been steering toward an ethic of ecology based on the Bible — the key word is "stewardship." They publish a monograph (**To Be Christian Is To Be Ecologist**) and a newsletter. Their directive is The Eleventh Commandment: "The Earth is the Lord's and the fullness thereof; thou shall not despoil the Earth, nor the life thereon."*

—Kevin Kelly

Until the last few years, it's been pretty hard to take Christians seriously when it came to ecology. In fact, the ecology movement seemed, along with Zen Buddhism, to be among the viable alternatives to the lackluster do-nothingism of the Christian churches. Aside from human rights concerns and Third World liberation theologies, the real action appeared to happen in the secular quarter where ecological outrage and appropriate technology were the amen and hallelujah of those who really cared. It seemed that if you weren't Native American or a disciple of Suzuki Roshi or Gary Snyder, then spirituality (especially the Christian religion) was not only ineffective and irrelevant but occasionally the fall guy for the whole mess. When Lynn White, Jr. blamed Western Christianity for the ecological crisis ("The Historical Roots of Our Ecological Crisis," originally published in ***Science***, March 1967, but reprinted widely and with great glee throughout the 1970s), environmentalists applauded and most Christians got defensive and apologized and began looking for preservationist organizations to join to assuage their consciences.

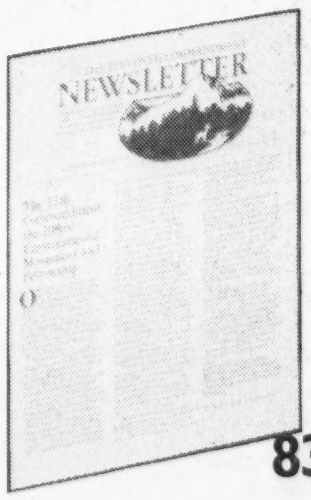
Fortunately, not everyone bought into this unfair accusation. Vincent Rossi's ***The Eleventh Commandment: Toward an Ethic of Ecology*** went on the offensive, declaring unequivocally that it was the abandonment of authentic Christianity that opened the way for the environmental crisis. In the last few years some good books (and some absolutely dreadful ones) have appeared to defend the stewardship tradition as taught in the Holy Bible. To many ecologists, especially those who refer to themselves as "deep," stewardship is a question of too little, too late. The search for a new paradigm, which is like saying, "Hey, religion doesn't work any more," is coming up with some interesting hypotheses but hasn't come close to delivering a new Elijah to remind us that the actual root of our dilemma is that, in the words of Solzhenitsyn, "Men have forgotten God!"

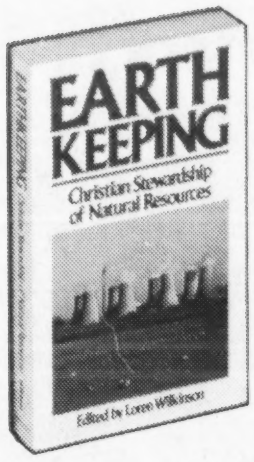
Three good books that make their stand with the prophets yet propose down-to-earth action plans are ***Earthkeeping: Christian Stewardship of Natural Resources***, edited by Loren Wilkinson; ***The Environmental Crisis: The Ethical Dilemma***, edited by Edwin Squires for the AuSable Trails Institute for Environmental Studies; and ***A Worldly Spirituality***, by Wesley Granberg-Michaelson. Though all three share a similar evangelical tone, each contributes something helpful that, when put together, give a solid Biblical foundation. ►



To Be Christian Is To Be Ecologist
Epiphany, Vol. 6, No. 1
Peter Reinhart, Editor
Fall 1985; 116 pp.
$6 postpaid from:
Epiphany Press
P. O. Box 14606
San Francisco, CA 94114

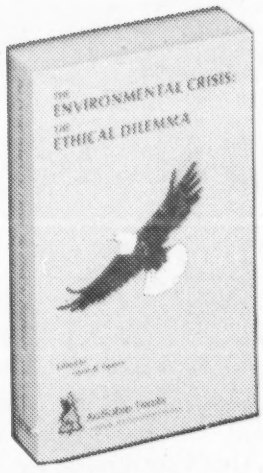
The Eleventh Commandment Newsletter
Vincent Rossi, Editor
Free from:
The Eleventh Commandment Fellowship
P. O. Box 14727
San Francisco, CA 94114





Earthkeeping
(Christian Stewardship of Natural Resources)
Loren Wilkinson, Editor
1980; 317 pp.
$10.95
postpaid from:
William B. Eerdmans Publishing Co.
255 Jefferson Avenue SE
Grand Rapids, MI 49503

The Environmental Crisis
(The Ethical Dilemma)
Edwin R. Squiers, Editor
1982; 375 pp.
$6.95
($7.95 postpaid) from:
AuSable Trails Institute of Environmental Studies
Route 2, Box 232
Big Twin Lake
Mancelona, MI 49659



What I liked about ***Earthkeeping*** is its creative use of information charts and graphs and the nicely choreographed presentation of essays that always manage to stay anchored in practical application, culminating in a confessional case study of what the editors went through to decide whether or not to print the book on recycled paper.

The Environmental Crisis: The Ethical Dilemma presents a cross-section of opinions and ideas that emerged from a Christian conference held at the AuSable Trails Institute for Environmental Studies in Mancelona, Michigan. Not all Christians agree amongst themselves, but this book isn't afraid to explore their differences while always pushing toward solutions. The chapters that deal with strip mining, earth-sheltered housing, and the response of the churches to the shrinking petroleum supply all display a commitment to Christian action.

A Worldly Spirituality expresses a deep sense of compassion for God's handiwork, which might be expected from someone formed in the Sojourners Community (a Christian fellowship primarily known for its involvement in social justice). Granberg-Michaelson's chapter on the world's future, which attempts to bring together the prevailing millenialism theories into a more realistic eschatological scenario, is a good example of some of the unique challenges facing Christian ecologists.

Any or all of these books can be seen as fundamental introductory steps toward developing a distinctly Christian approach to taking responsibility for the plight of this world. The Christian community is like a sleeping giant and, in my opinion, awakening it to its inherent moral imperative is the only hope remaining for the survival of this planet.

—Peter Reinhart

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Domination implies covenant because the earth exists in her own right and God has established direct relations with her and all her children. "And God said, 'This is the sign of the covenant which I make between me and you and every living creature that is with you, for all future generations: I set my bow in the sky, and it shall be a sign of the covenant between me and the earth'" (Gen. 9:12-13). God's covenant with humanity and humanity's responsibility for stewardship and dominion means that humans must respect and honor God's prior covenant with all creation.

—The Eleventh Commandment Newsletter

•

To be stewards at all, however, we must have something over which we can exercise control. If we are called to be God's managers, there must be something sufficiently within our control to manage. Otherwise, the call to be proper stewards would be hollow indeed. Of course, no one is without at least something over which stewardship can be exercised. All people can exercise stewardship over their time and talents — at least to some degree. The fact is, though, that literally millions of people around the world have insufficient control over the earth's resources to prevent their own and their children's starvation. They lack, as it were, "stewardship possibilities" over the earth's resources. *—Earthkeeping*

•

Christianity, we must recall, is also, in its origins, an Eastern religion. Our brothers and sisters from the Eastern Orthodox tradition bring to their theology a far richer — and I suspect more biblical — understanding of how God's redemption extends to the creation. They have always asserted that in the incarnation, God in Christ acts to restore the world, and call it back to himself. Redemption is the promise of creation being made whole and new, as well as our own lives. As contemporary Orthodox theologian Paulos Gregorios writes, "Human redemption is inseparable from the redemption of time and space as well as of 'things.'"

—A Worldly Spirituality

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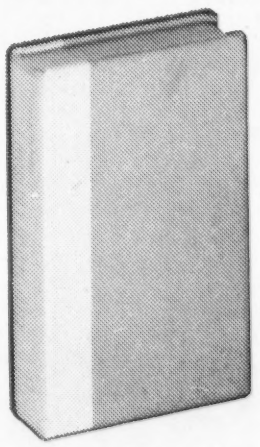
What is needed is for men and women to feel *religious* about nature. We need "monks" and "nuns" in the temple of the Earth, men and women who are willing to take a vow of obedience to God by serving nature, to make their lives a witness to the value of the Eleventh Commandment. Christian monasticism has long recognized that people who take vows into the religious life are entering into a state of matrimony with Christ. Their souls are as brides, Christ is the Bridegroom, and subsequent life is the marriage feast. Can we not extend that monastic spirit into our ordinary relations with the natural world as the need for men and women to meet and marry Christ in nature?

—To Be Christian Is To Be Ecologist

A Worldly Spirituality
Wesley Granberg-Michaelson
1984; 210 pp.
$12.45
($13.95 postpaid) from:
Harper and Row
Keystone Industrial Park
Scranton, PA 18512



SOFT TECHNOLOGY

The Production of Houses

This records the successful completion of a housing project done according to architect Christopher Alexander's unorthodox theories. The project was set in Mexico, mostly to avoid American building codes which conspire to keep design and construction in the hands of architects and builders. Alexander requires that the end users of a building can and must participate in its construction from start to finish — not merely in an advisory capacity. If necessary, the project is guided by a "master builder" (in this case Alexander) who acts as coordinator, inspiration, and source of critical information.

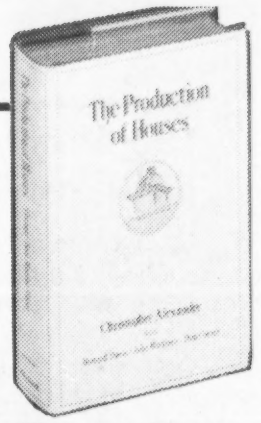
This book happily avoids the pontificating tone of his earlier works, ***A Timeless Way of Building*** *and* ***A Pattern Language*** *(**NWEC** p. 217). Careful attention has been paid to the social interactions as well as to the building.*

I find this book inspiring, essentially "right," and certainly one to read before building anything. My only qualm is that the ideas are offered as THE way to build — an extreme claim. But this may be the only way to effectively emphasize a position that is, regrettably, seen by many people as radical. Too bad. In this case, "radical" is just good sense. —*J. Baldwin*

•

In the Mexicali project, it was, above all, a very human thing that happened on the site. For in the end, the reality of the process — quite apart from the principles of the architect-builder, and the house cluster, and cost accounting, and all that — is what people dealt with day by day, and what now remains in everyone's memory even after the construction has stopped.

The night watchman walking by the window at sunrise on his way home, the dusty sun already beginning to bake our rooms . . . The men who deliver the sand and gravel coming by every couple of days, the great piles of gravel slipping out of the truck; writing a bill; giving them a check every week . . . Driving across town to buy electrical supplies; waiting in the supply house with the electricians, drinking cool water; loading the tubing and fittings into the truck.



The Production of Houses
Christopher Alexander
(with Howard Davis, Julio Martinez, Don Corner)
1985; 383 pp.
$39.95 from:
Oxford University Press
16-00 Pollitt Drive
Fair Lawn, NJ 07410
or Whole Earth Access

House Building Basics

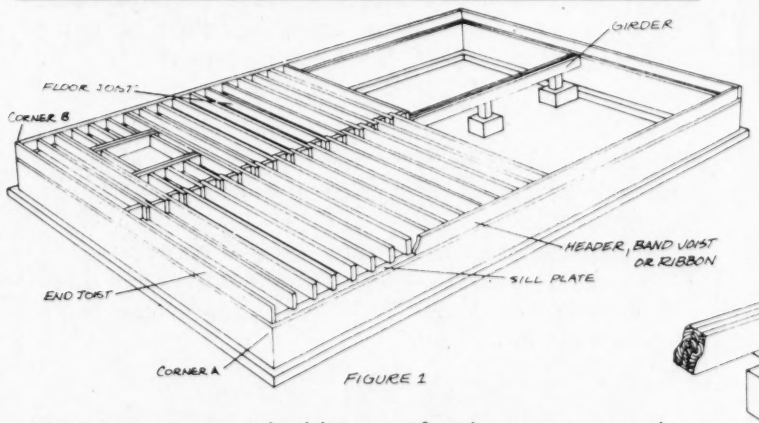


FIGURE 1

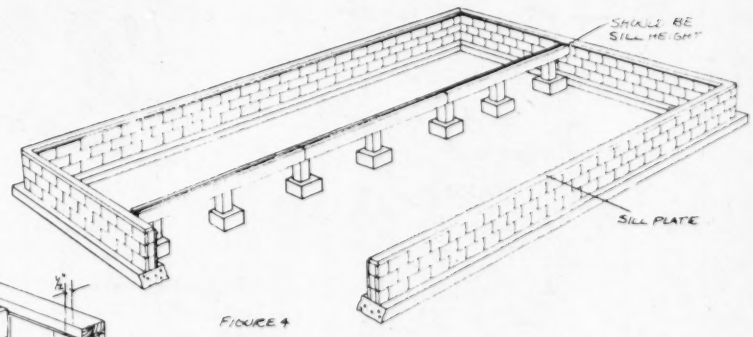


FIGURE 4

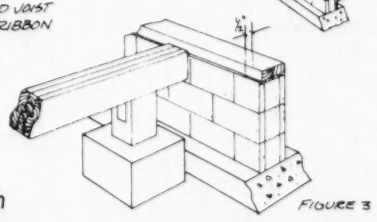


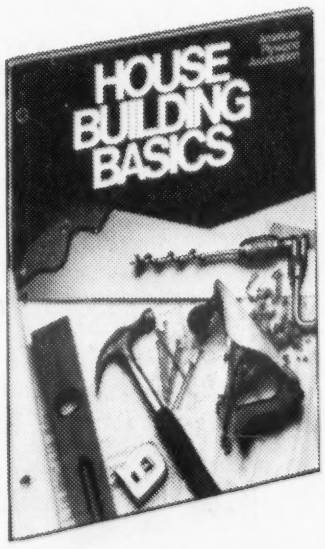
FIGURE 3

We're going to start building our first house in a month or so. We've got the property and the permits and have read an overwhelming number of instructive books. None, however, has been as straightforward as this brochure.

It illustrates the basic steps to complete the structural shell of a typical, stud-frame single-family residence — from foundation to roof. It tells you how to select wood for each component and how many nails of which size to use for every joint. The publisher intends you to use plywood, so the brochure is especially helpful on the subject of sheathing.

We're not building a conventional rectangular house and you probably aren't either. But I found the clarity of this little book so refreshing in the face of the enormous task that it renewed my faith that anything at all could ever get done. And that's worth a lot more than the price of this book.
—*Don Ryan*
[Suggested by R. Fugett]

House Building Basics
1984; 36 pp.
free from:
American Plywood Association
P. O. Box 11700
Tacoma, WA 98411

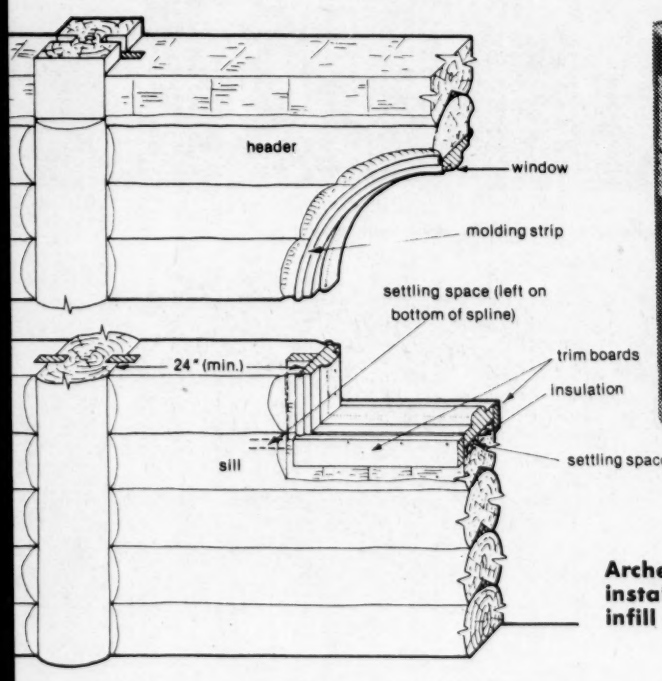


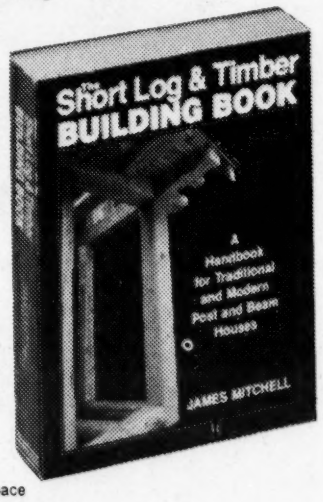
The Short Log and Timber Building Book

The ever-tempting conventional log cabin requires relatively long, straight logs that are awkward, heavy and possibly dangerous — assuming you have access to a supply of them. The method shown in this book utilizes short lengths to fill the walls of post-and-beam construction. Many folks will find this is an easier way to build, especially using the instructions so clearly presented here. The book abounds in helpful tricks of the trade, which may also prove useful to people not interested in logs at all. As with all schemes making use of so-called "indigenous materials," bear in mind that you may not save much money; walls are only about 20 percent of the cost of a house. —J. Baldwin

The Short Log and Timber Building Book
James Mitchell
1985; 288 pp.
$12.95
($13.95 postpaid) from:
Hartley & Marks, Inc., Publishers
P. O. Box 147
Point Roberts, WA 98281
or Whole Earth Access

This log post and beam country cottage can be constructed by an owner-builder with materials gathered primarily from the land.





Arched window installed in wood infill wall.

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Girdling

A Bavarian tradition involved climbing the standing tree and removing a strip of bark from around the trunk, just below the crown. With photosynthesis cut off from the rest of the tree, the roots cease absorbing nutrients while the leaves continue to draw the vital fluids. Slowly the portion of the tree below the girdle dries out, in effect seasoning the tree while it is still standing. The problem with this method is the labor involved in climbing and girdling each tree. A slight adaptation of this process is to cut a deep girdle at the base of the tree, well into the sapwood, so as to "choke" it.

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Some builders keep a modified chain on hand for cutting arches. Removing every second cutting tooth on one side of the chipper chain will result in a curved cut.

House

Like the needle of the acupuncturist, this book is accurately, painfully, exquisitely right. On the surface it chronicles the building of a home from conception to move-in. But what it's really about is the subtle class-struggles that go on between people who are "professionals" and those "in the professions" — in this case the owners are a lawyer and a Ph.D. educator confronting equally educated carpenters. Ego trips abound. Misunderstandings worthy of a tempestuous-yet-loving marriage illuminate the scene with snarls, huffs, laughs and compromises. Just like real life.

Mr. Kidder, who brought us interesting insights into the world of computers in ***The Soul of a New Machine*** *(CQ #32, p. 127) dares much more here as he gets into the minds of the people involved. He gets the house built too; the procedures and nomenclature are as accurate as the social analysis. "Ho hum," you say? Bet you stay up all night to see how it all turns out, just as I did. At the very least, you'll get a good idea of what it's going to take to build that dream house.* —J. Baldwin

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When they put plywood on the joists and studs covering the cellar hole, they fasten the sheets with only a few nails, and then, while the others move on to other tasks, one of them fastens the plywood securely with a pneumatic staple gun. They came across this technology a few years back when repairing a fairly new house. Its builders had used staples to fasten the plywood to the exterior walls and Apple Corps could pull that plywood off with their hands, the staples made such poor fastenings. They assumed they would never use such junk themselves. Staples had improved, though, and now were strong enough. Nailing plywood down had always bored them. Ned already owned a compressor. They needed to buy only the staple gun. They weren't in their midtwenties anymore, either. "When your arm gives out, you turn on the compressor," says Ned, doing just that.

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Masons sometimes sign their work, as carpenters do. When he was finishing off that chimney cap, Dick Staelens wrote in the wet concrete on the very top. Jim had been leaving messages around the house, describing Staelens as an "old goat," and Staelens thought he'd get even. You can't see what he wrote unless you climb up to the chimney and look for it. The message reads:

GENTLEMAN JIM 83

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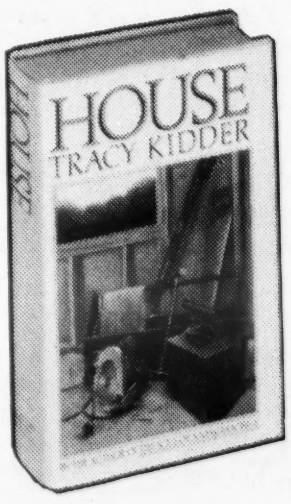
Jim looks around the table. He says, "I realized this summer that I don't want to compromise the work for money."
"We don't want to do it cobby," says Richard.
"We *can't* do it cobby," says Jim. He looks glum again.
"So in that mode," says Ned, "we're gonna have to . . ."
"Charge more."
"Charge more."



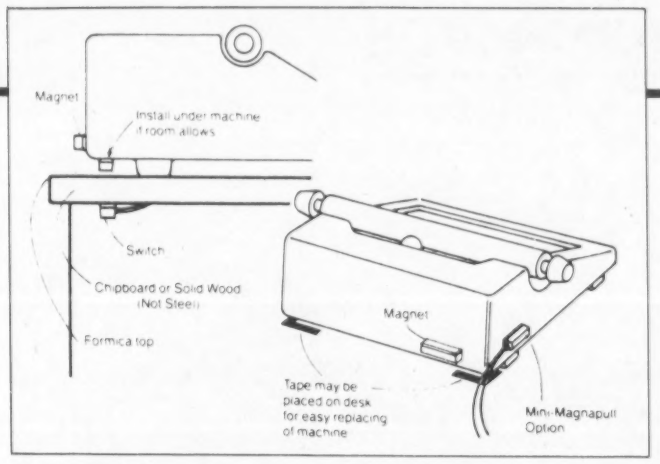
House
Tracy Kidder
1985; 341 pp.
$17.95
($18.95 postpaid) from:
Houghton Mifflin Co.
Attn.: Mail Order Dept.
Wayside Road
Burlington, MA 01803
or Whole Earth Access

Mountain West

This rather bland company name gives no hint of its business: do-it-yourself burglar alarms. Their catalog lists a huge variety of devices and systems, plus the tools, accessories and other arcana that'll help you get the job done. There are pages of hints for protecting unusual possessions such as boats and art objects. A selection of suitable instruction books will aid those not savvy in the skills involved, though it'd sure be a help if you already were handy with the basics.

There is a better-than-average possibility here for substantial savings, assuming that you use good sense; fancy security installations take lots of time because each case is different. We should be glad the equipment is available to "civilians" rather than exclusively to "experts." After all, who knows your situation best?

—J. Baldwin

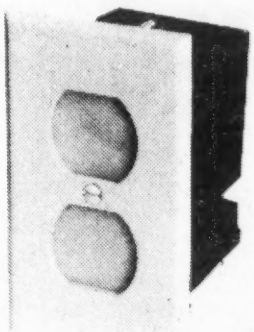


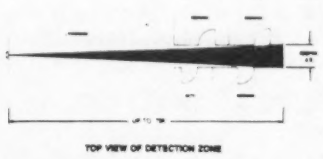
Mountain West
Catalog
$2 from:
Mountain West
4215 N. 16th Street
P. O. Box 10780
Phoenix, AZ 85064-0780
800/528-6169

Holdup Money Clip

Two bills are placed in the clip, then covered with more bills. Removal of the last two bills triggers the alarm. SPDT relay, 3-wire pigtail attached. Safest holdup device to use wherever cash is handled.

72A11-057 Money Clip 8.00





Disguised Flush Mount PIR

Looks Like Wall Outlet
Easy to Align with Pattern Locator

72A32-019 Concealed 75' Beam PIR $219
(4 or more: $197)

The Complete Canvas Worker's Guide

I can't vouch for the "complete." "Canvas" means boat canvas: sail covers, dodgers, sea anchors, hatch covers and the like. Many of the techniques could be used away from the sea as well. The "worker" is you. It's assumed that you have sewn before, or at least are not afraid to try. If you're a beginner, I'd advise getting a wad of worn fabric and messing around until you feel some confidence driving the machine with its finger-threatening needle. The "guide" part is experienced and often downright clever, well illustrated and explained. The sort of skills addressed here tend to open whole new areas of endeavor to anyone willing to spend the time learning. There's nothing like the fine control of design that's available only to those able to execute their own ideas. —J. Baldwin

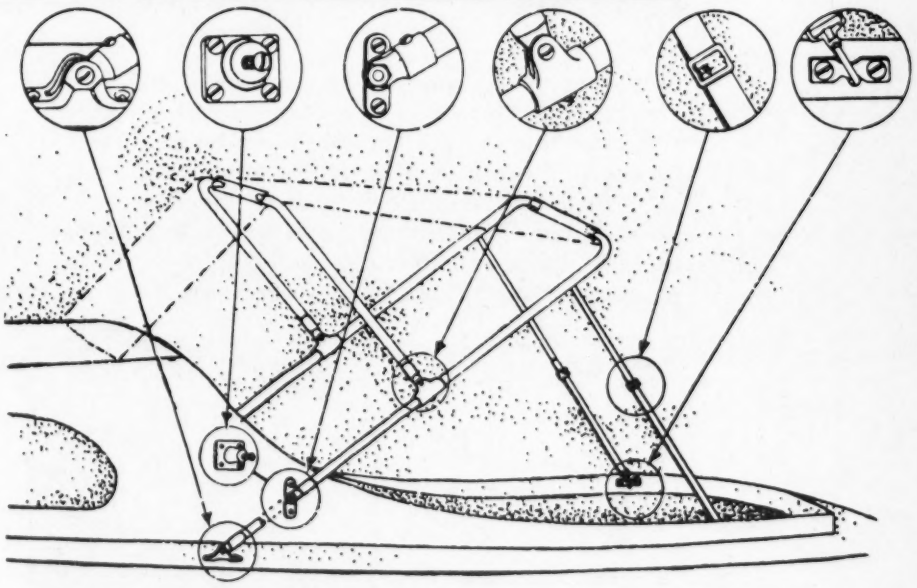


FIGURE 3: *A Dodger Frame*

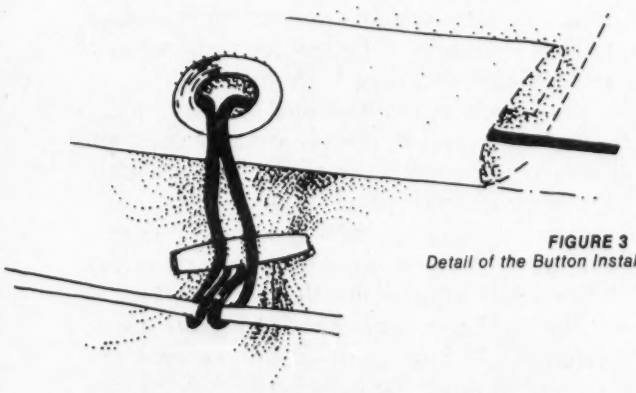


FIGURE 3
Detail of the Button Installation System

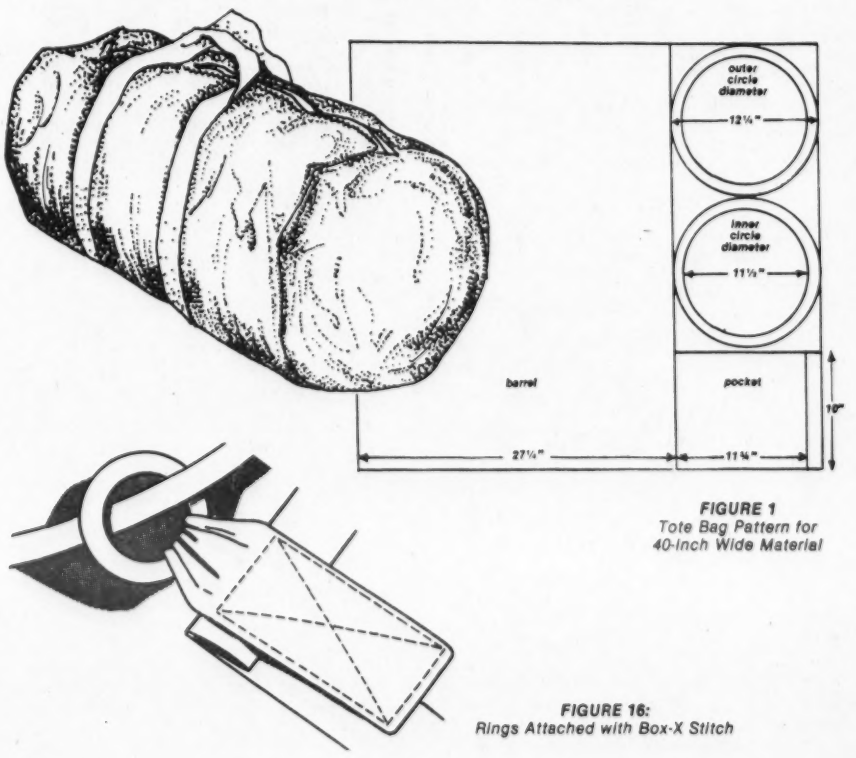
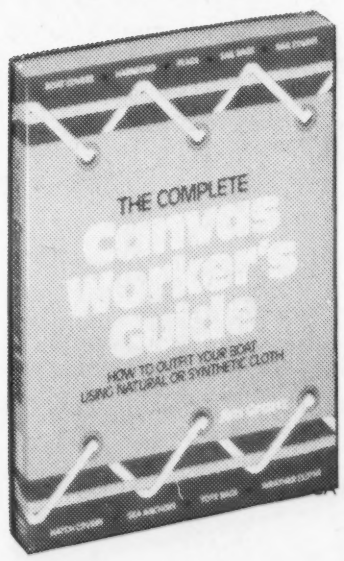


FIGURE 1
Tote Bag Pattern for 40-Inch Wide Material

FIGURE 16:
Rings Attached with Box-X Stitch



The Complete Canvas Worker's Guide
Jim Grant
1985; 172 pp.
$14.95
($17.95 postpaid) from:
International Marine Publishing Co.
21 Elm Street
Camden, ME 04843
or Whole Earth Access

94965

Owning a large yacht makes no sense unless you plan to sail at least two months a year. You can round the Fastnet Rock off southern Ireland in a bareboat, too.

Bare-Boating

Put your bathing suit back on, this is about how to go sailing without owning a boat (or having it own you). There are a lot of sailors who'd like to spend their once-a-year vacation at sea, but can't afford to keep a boat the rest of the time. Bare-boat charters are for them (us). At first, the prices asked seem outrageous, but they're not if you are honest about what it really costs to keep a boat in the family. Moreover, if you have some friends (they'd better be good ones), you can share the costs down to a more reasonable size. This very complete book will help you decide what sort of boat you need, how to get it, how to get familiar with it, and where to sail it. What more could you ask? Reading this is the first step to that Bahamas dream. —*J. Baldwin*

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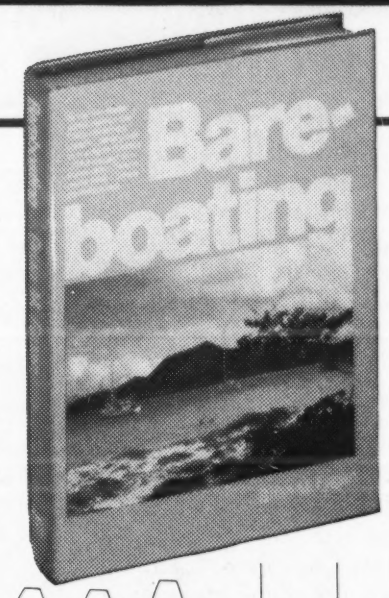
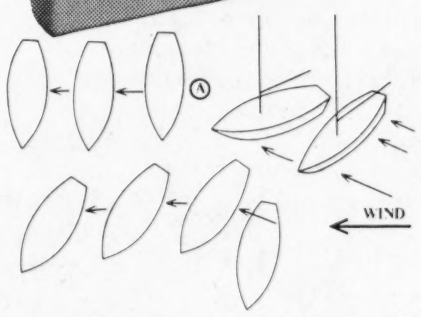
Be able to sail! This may seem self-evident, but it is amazing how many people try to go bareboating with little more than a book knowledge of sailing. The marina staff are experts at sniffing out book learners from practical sailors. Don't try to fool them — the stakes are too high. But the good news is that anyone who has learned to handle a small dinghy or trailer yacht on a river or lake will have acquired the instinctive behavior with mainsheets, jibsheets, and halyards that is essential in larger, heavier-displacement yachts. So your apparent lack of big-boat experience may not limit you as much as you had imagined. . . .

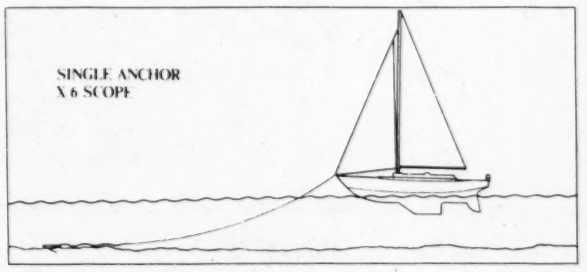
There is one golden rule for the beginning charterer: *Be honest about your sailing experience both with yourself and the charter company.* It is only fair for both of you. Self-deception is bound to catch up with you.



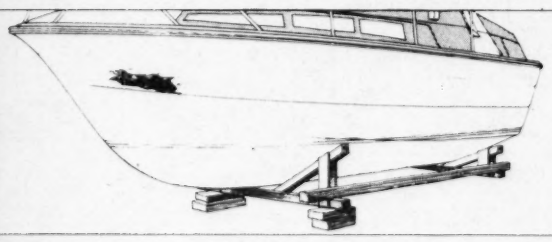
Bare-Boating
Brian M. Fagan
1985; 288 pp.
$34.95
from:
International Marine Publishing
21 Elm Street
Camden, ME 04843
800/341-1570
or Whole Earth Access

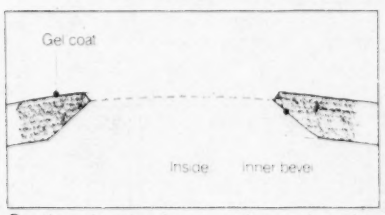


A modern yacht when drifting with rudder free tends to seek the wind with her stern. She lies almost abeam, or with stern to the wind. Try this with your yacht and determine her tendency as early in the charter as possible.

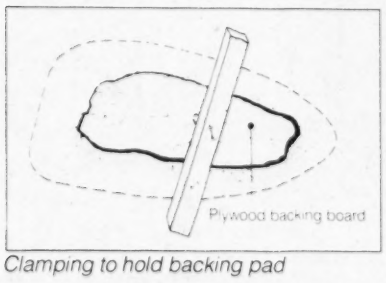


The properly anchored charter yacht, with six times scope, and short length of chain weighing anchor on the bottom.

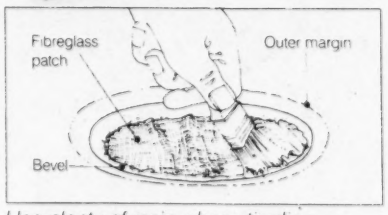




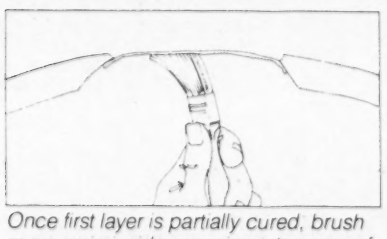
Section showing inner and outer bevels



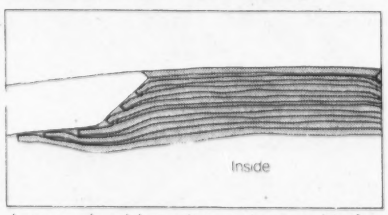
Clamping to hold backing pad



Use plenty of resin when stippling



Once first layer is partially cured, brush more resin inside, pressing into curve of hull



Lay up should overlap on to margin of hole with additional 25% thickness on inside

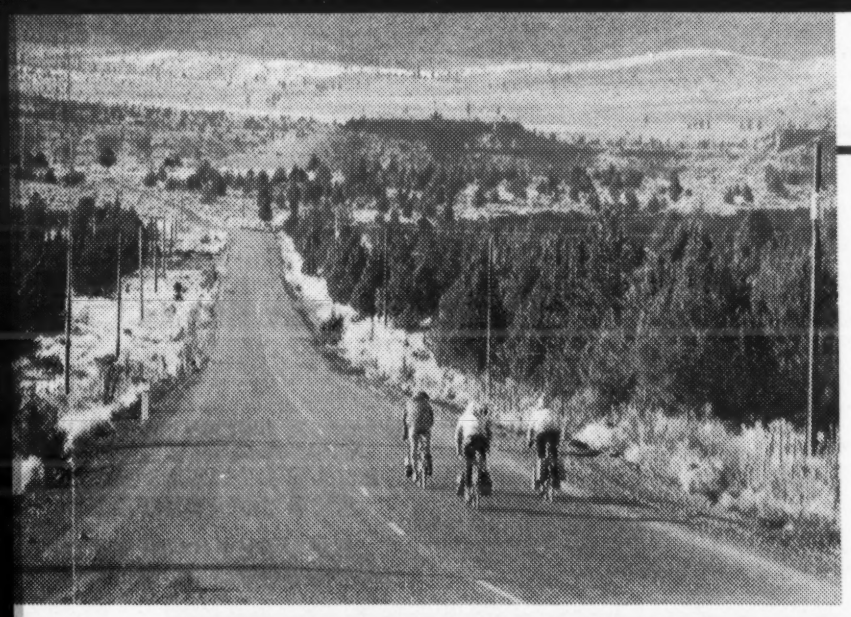
The Boat Repair Manual

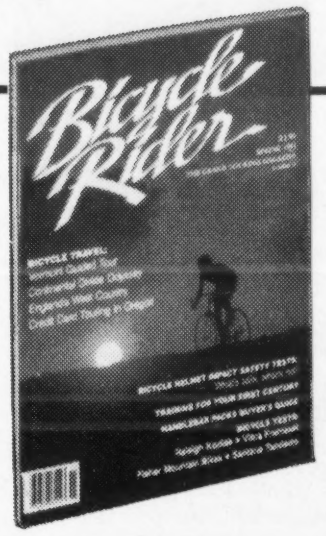
The person who first defined a boat as "a hole in the water, lined with wood, into which one pours money" must have been looking at a repair estimate. High repair costs shouldn't be too surprising, though, when one considers that boats are assembled to stay together under horrible conditions — they're not made for easy repair. If economics isn't sufficient incentive to do the fixing yourself, then convenient scheduling and location, and personal satisfaction might be. This remarkably complete manual will help too. Though a certain facility with tools and boat lingo is assumed, the level of expertise is no more than one would expect an intelligent boat owner to possess. The repair techniques are elaborately described and are illustrated with some of the clearest drawings I've yet seen. The most commonly needed repairs are given extra detailing. All boat construction materials are considered, as well as rigging and engines. A thorough reading of the appropriate chapters should enable you to deal with just about any repair at sea, and will give you a good idea of what materials and tools to have aboard. You should have this book aboard too, in a waterproof bag (surprisingly not included).

—*J. Baldwin*

The Boat Repair Manual
George Buchanan
1985; 312 pp.
$29.95
postpaid from:

ARCO Publishing
Prepaid Dept.
215 Park Avenue South
New York, NY 10003
or Whole Earth Access





Bicycle Rider
Don Alexander, Editor
$11.98/year
(9 issues) from:
Bicycle Rider
P. O. Box 900
Agoura, CA 91301

The MSR Bicycle Helmet ► passed the ANSI test with flying colors and is a very good helmet, especially for off road use.

Ken Crites tests the Bruce Gordon Chinook and the Cannondale rain suit in Oregon's snow.

Bicycle Rider

"The Grand Touring Magazine," it says on the cover of this brand new and very slick production. Fat with expensive ads, it nonetheless seems to pull no punches in a lab test comparing helmets — the failed ones are called right out by name. The touring articles are inciting, to say the least, and consider routes all over the world. I appreciate the basic idea of this effort; there's a lot more to bicycling than gonzo racing. The magazine has a few obvious boo-boos in this first issue (photos printed backwards, etc.), but reader reaction will doubtless help the editors clean up their act. Meantime, it looks like a winner for us bike-trippers. —J. Baldwin

•

If your group is new to backcountry touring, think carefully about the number of miles you plan to cover daily. We have found that an average of 30 miles a day on a rough-stuff tour is about right. The strong riders can do better than that, but they might appreciate the time to enjoy the scenery and smell the flowers. This also provides the group with a reserve factor, allowing the stronger riders to help the others over particularly rough spots. This saved the trip for us on a recent mountain tour. We found ourselves pushing mountain bikes over a 12,840-foot pass that was written up as the most terrifying four-wheel-drive road in the Rockies. Only our strong-rider reserve got the rear riders over that mountain. We were *all* late for dinner that night, but not one of us missed it.

International Travel News

How 'bout some middle-of-the-road traveling — not first-class finery, but not shoestring-budget adventure, either. You could call it minimum-hassle-per-dollar traveling — for retired folks, people with kids, or travelers who can afford to stay in hotels rather than cheap inns. This thick newsprint journal is jammed with reader-written reports evaluating package tours, naming hotels, grading airlines for service, telling you where ordinary people went and what they liked. Frequent world travelers would find it worthwhile. It's certainly more useful than any color travel magazine I've seen. —Kevin Kelly

•

One thing I learned this summer is this: don't take the TWA Super Saver unless you are willing to stay in remote hotels.

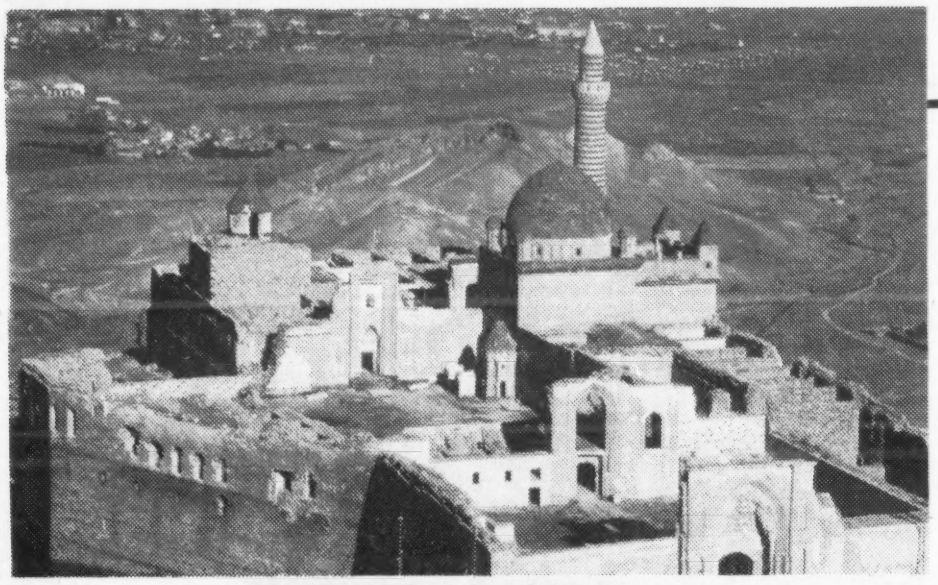
Don't get me wrong; the hotels were clean and well run but difficult to get around from on free time from the regular tours. The TWA top-value tour is very little more and we felt had better hotel locations.

This year we visited seven countries in 15 days as part of our European vacation. It was well worth the money, but it's not for anyone in anything but good health as it was a fast pace.

Phyllis J. Peal
St. Louis, MO

Choose one! Andorra does not have its own mail system. For letters bound for Spain or south, use the box on the left. Letters to France or northern countries should be posted in the box on the right. According to the locals, the French mail system is speedier for letters or cards to the U.S.

International Travel News
Armond Noble, Editor
$12/year
(12 issues) from:
International
Travel News
2120 28th St.
Sacramento, CA 95818



Ishan Pasa Palace, Dogubayazit.

Turkey: A Travel Survival Kit

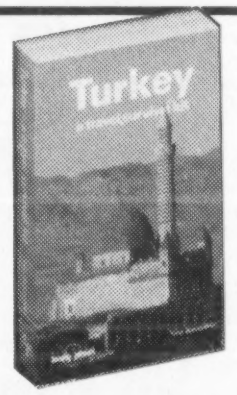
You'll need a survival kit for this rugged country. Once the crossroads of all travel, lately Turkey has been bypassed by everybody. That neglect has kept away trustworthy travel info, and has fostered a reputation of being somewhat untamed — bandits, uprisings, oriental intrigue — a notoriety encouraged by its desolate plains and fierce high country. Those who do pass through find Turkey among the most memorable of places, in part because of its unpretentious simplicity — there are no menus at restaurants. You go into the kitchen and point to what you want. This compact and vital guidebook, the only source of useful, updated travel details for Asia Minor, makes a pleasurable journey there a sure bet. —*Kevin Kelly*

•

Telephone tokens For most calls, you'll need a *jeton* (zheh-TOHN, token), or perhaps several. They come in two sizes. The smaller ones (*kucuk jeton*, kew-CHEWK zheh-tohn) are for local calls. The larger ones, which cost ten times as much, are for long-distance calls. Buy your jetons at the post office, or from a disabled person outside the post office.

Local calls Once you have your token, find a phone. There may be a waiting line. You will find one of four types of phones. The desk phones with a small box attached take big jetons for local calls. These are the ones you find in grocery shops and offices. For the old black wall telephones, don't put the jeton in the slot on top until your party answers. For the newer red or gun-metal grey phones, put the jeton in before you dial; if you don't get through, it will be returned to you.

Turkey
(A Travel Survival Kit)
Tom Brosnahan
1985; 326 pp.
$8.95
($9.95 postpaid) from:
Lonely Planet
Publications
P. O. Box 2001A
Berkeley, CA 94702
or Whole Earth Access



Multinewspapers

Before leaving town on extended travel or moving to a new home, check out your destination by reading its local newspaper. Local newspapers fill in details like no other travel reading can, and you can get an idea of the most current prices for things from the ads. This service has great rates and a global selection. Their random selection service would be one way to spice up your mailbox.
—*Bud Spurgeon*

Multinewspapers
Information **free** from:
Multinewspapers
Box DE
Dana Point, CA 92629

NUMBER	NAME	PRICE EACH AIR	SURFACE
307	GHANA WEEKLY SPECTATOR		1.00
308	KENYA DRUM MONTHLY		2.20
394	BAGHDAD OBSERVER	*2.70	
395	TIMES OF MALTA	1.00	0.55
396	SUNDAY TIMES OF MALTA	1.40	0.80
408	DUBLIN EVENING PRESS	2.65	1.65
409	CORK IRELAND EXAMINER		1.75

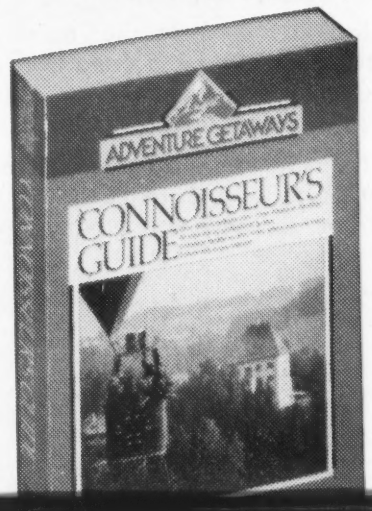
A Connoisseur's Guide

Although I've never joined a hired adventure tour, I have many friends who've gone to some of my favorite exotic places with them, and they had nearly as good a time as I did. The adventures you can buy are quite sophisticated — very small groups, highly informed guides, experienced schedules, and lots of choices. To aid shopping among the choices, check out this paper database of 2,000 unusual trips led by pro guides. You select a journey by place, by mode (bicycle, canoe, hiking, etc.) and by the date it all happens. Say, for example, you dream of cruising in a four-wheel-drive through the Sahara in January. Well, you've got a couple of possibilities here. Hope they keep it updated. —*Kevin Kelly*

TRIP PROFILES — WILDLIFE SAFARIS 167

Company	GameTrackers International Inc	InnerAsia	InnerAsia	InnerAsia
Mode of Transportation	4WD, Plane	Coach, 4WD	Coach, 4WD	4WD, On Foot, Canoe
Name of Trip	Okavango	Adventure in Paradise	In Search of Royal Bengal Tiger	Wilderness and Wildlife of Nepal
Location	Okavango Delta	Various Game Parks	Various Parks and Reserves	Royal Bardiya Wildlife Reserve
City **State** **Country**	Victoria Falls Zimbabwe	Colombo Sri Lanka	Delhi India	Kathmandu Nepal
Duration, Days **Distance** **Elevation**	5	16	19	19
Trip Month	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
Cost	P1328*	$1075	$2340	$1730
Degree of Difficulty	Open	Open	Open	Open
Baggage Carried By	Vehicle	Vehicle	Vehicle	Vehicle
Meals **Lodging**	Included Camp, Lodge	Some Included Hotel	Some Included Camp, Hotel, Lodge	Included Camp, Hotel, Lodge
Comments	*Botswana Pula - Physically Handicapped, Seniors, Dietary	Seniors, Dietary	Seniors, Dietary	Seniors, Dietary

A Connoisseur's Guide
Suzi Kobrin, Editor
1985; 325 pp.
$19.95
($21.95 postpaid) from:
ZapoDel Inc.
P. O. Box 1049
Del Mar, CA 92014
or Whole Earth Access



The Tropical Traveller

For lack of a better book on traveling in the tropics, I suggest this one. It's a little short on the effects of hot climate, equatorial terrain, and tropical disease, but it's long on the difficulties of zipping through materially poor societies, which, unfortunately, most tropical countries are these days. You get an honest picture of on-the-road life in an undeveloped country, and some honest tips worth hearing. With the masterful ***Art and Adventure of Traveling Cheaply*** *(**NWEC** p. 398), now out of print, you should read this book for basic Third World travel skills.*

—Kevin Kelly

•

Travellers should take an *antiseptic cream*. I would never travel without a tube of Savlon (which contains cetrimide). It is safe, soothing, cleansing, and non-greasy and is useful for a wide variety of skin ailments and sores, as well as the usual cuts and scratches. Even a sore anus, which is often caused by bad attacks of diarrhoea, is soothed by this versatile cream.

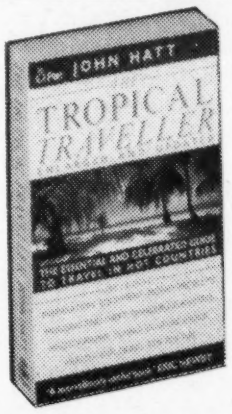
•

Scorpions feature regularly in travellers' tales. On the whole they are not as bad as people say, so don't get too distraught if you are stung by one. When an old lady in Indonesia was giving me a massage, she was stung by a scorpion on her finger; she merely shook the finger and continued. Nevertheless, there are many different types of scorpion, and some are much more dangerous. Because children have small bodies, the venom affects them much more severely.

•

In my earlier years of travelling, I wasted far too much time and money on shopping-sprees: hoovering up 'antiques', clothes, knick-knacks — almost anything. Somehow, buying was part of being abroad. I then reacted against this, and always returned home empty-handed. Now, it amuses me to search for just one object which captures best the spirit of the country I've visited.

Travel with as little luggage as possible.



The Tropical Traveller
John Hatt
1985; 267 pp.
£2.95
(£3.30 postpaid) from:
Pan Books, Ltd.
Cavaye Place
London SW10 9PG
England

The Africans

More than South America or India or Asia, Africa is the continent where world history is being generated these days. Fifty-one independent nations, 750 tribal languages, fabulous natural resources, and roiling post-colonial turmoil — it adds up to human intensity and consequence unmatched on Earth.

It also adds up to enormous confusion. No other book comes close to David Lamb's in cutting through the inside propaganda, the outside idealizing, the sheer volume of data that keeps Africa "dark" to most of the world. Lamb spent four years based in Nairobi, Kenya, as a journalist for the ***Los Angeles Times*** *(1976-80; this new edition is updated to 1985), traveled to 48 of the countries, and talked to most of the major figures. His reporting and his insight have depth as well as breadth. Nothing I saw in two months in Kenya contradicted Lamb's book, and nearly everything supported it, including the fact that "liberal" Kenya now bans sales of* ***The Africans*** *(President Moi didn't care for the lukewarm reviews Lamb gave his administration).*

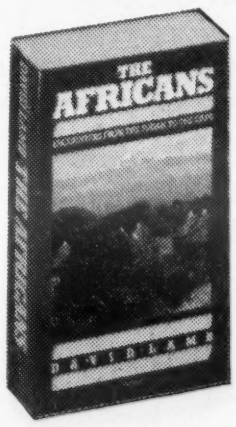
Anyone going to Africa or concerned about any country in Africa should have the book. Africa breaks your heart every day — with its beauty and soul, with its wretched situation, with its promise, with its menace, with its unending fascination and variety. What this book has that Africa doesn't is clarity. *—Stewart Brand*

•

Given all he has had to endure from the beginning of slavery to the end of colonialism, the African displays a racial tolerance that is nothing short of amazing. He holds no apparent grudge against the European as an individual, and it is rare indeed for any white person to experience even the slightest indignity because of his color. There are virtually no urban areas in Africa that are off-limits to whites as are, say, parts of Harlem in New York or Roxbury in Boston. There are no hostile stares, surly responses or epithets like "whitey" or "honky." In the Ivory Coast, the white population is five times greater than it was at independence in 1960. In Kenya, 5,000 former British citizens have taken out Kenyan citizenship. In Mozambique and Angola, white citizens of those countries hold high-ranking positions in government. The African has forgiven, if not forgotten. He fought and negotiated for his independence for no greater reason than to end the pain of prejudice. Having won, he proved himself far more magnanimous than his colonial masters had ever been. He may have harbored animosities toward the Asians, but if you were white, it was your personality, not your pigmentation, that counted.

•

Seeing the decay of the cities, many Western visitors are startled to learn how potentially prosperous Africa is. Like a closet millionaire, it hides the riches that future generations on distant continents will need to prosper, produce, even survive. It has 40 percent of the world's potential hydroelectric power supply, . . . 50 percent of the world's gold, 90 percent of its cobalt, 50 percent of its phosphates, . . . 3 percent of its iron ores, and millions upon millions of acres of untilled farmland. There is not another continent blessed with such abundance and diversity.



The Africans
David Lamb
1983; 363 pp.
$7.95
($8.95 postpaid) from:
Vintage Books
Random House
Attn.: Order Dept.
400 Hahn Road
Westminster, MD 21157
or Whole Earth Access

The Partnership Book

The best book I've seen specifically about partnerships. Clifford and Warner are attorneys, partners (not in the same business), and experienced authors, and they have included in their 290-page book just about everything there is to know about the nuts-and-bolts end of partnerships. The book covers partnership "agreements" — the heart of every partnership — in detail.

—Bernard Kamoroff

•

If your business arrangement is relatively straightforward, and you're confident you've covered the basic problems in your partnership agreement, why pay lawyer's fees merely to get an authority-figure's stamp of approval? Even if you do use an expert, it is best not to dump the whole problem of creating your partnership on the desk. Remember, it's your business. Use this book and other available resources to figure out how to structure your partnership, and seek professional help only for the few areas you can't resolve unaided or want to have double-checked.

•

Subjects often covered in partnership agreements:

- Name of the partnership (and names of individual partners);
- Term of the partnership (indefinite, or for a set, limited time); and date started;
- Purpose of the partnership; the type of business to be conducted;
- Personal business goals of the partners and partnership;
- Cash and property contributed to start the business;
- What happens if more cash is needed;
- Skills to be contributed (hours to be worked, work duties of partners, management roles, possible other business activities, etc.);
- Distribution of profits;
- Losses (how divided);
- Salaries, guarantees, or drawing accounts;
- Disputes (rule by majority voting, provision for arbitration or mediation, etc.);
- Sale, assignment, etc. of a partnership interest;
- Admission of new partners;
- Expulsion of a partner;
- Continuing business if a partner withdraws, dies, becomes disabled, or retires;
- Determining value of a departing partner's interest, provisions for payment of that interest;
- Dissolution, winding up, and termination.

Partnership Agreement

Arnold Presnor and Imogene Grange agree as follows:

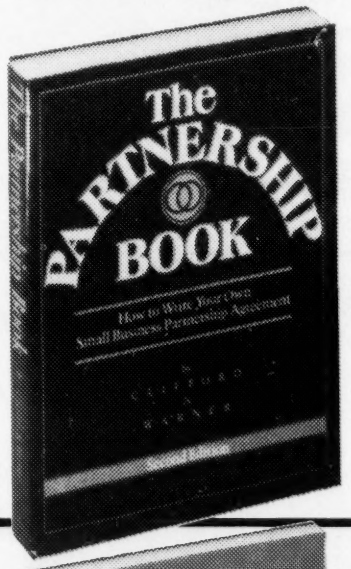
1) That as of July 1, 19 ____ they are partners in a business to be known as Acme Illusions. Acme Illusions will operate an interior design business in the greater Dallas, Texas metropolitan area;

2) That Arnold Presnor and Imogene Grange will each contribute $5,000 to get the business going and will be 50-50 partners;

3) That all initial decisions regarding business location, advertising, prices, etc., will be made jointly;

4) That neither partner will obligate the business for any debt in an amount more than $200 without the other's consent;

5) That within two months from the date of this agreement, a formal partnership agreement shall be prepared which will cover what happens if a partner dies, or quits, as well as partnership decision-making, a dispute resolution mechanism, etc.



The Partnership Book
Denis Clifford
and Ralph Warner
1981; 221 pp.
$17.95
($18.95 postpaid) from:
Nolo Press
950 Parker Street
Berkeley, CA 94710
or Whole Earth Access

Everything You Wanted to Know About Tax Shelters But Were Afraid to Ask

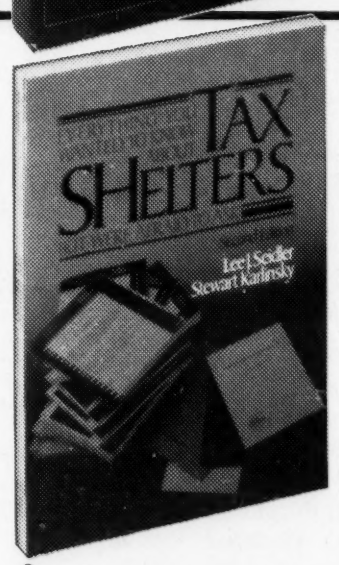
"Tax shelters," for better or worse, are two of the buzz words of the mid-80s, and despite all our nouveau sophistication, are still a mystery to most people. The term is used (and misused) broadly, but in real practice it refers to specialized investments that produce non-cash losses that are used to "shelter," or to reduce the taxes on, other taxable income. We're talking about oil and gas drilling, real estate syndications, heavy equipment, railroads. We're talking about Wealth — no, make that, Affluence. This is what the tax laws have always been about: allowing the wealthy to escape taxes.

So if affluence has you paying more of Ed Meese's and Casper Weinberger's salaries than you care for, this book will be of value to you. The writing is concise and to the point — unlike this review; technically accurate yet easy to understand. Don't be put off by the poor title (I doubt the authors chose it); the book is as serious as the subject.

—Bernard Kamoroff

•

It is reasonable to assume that married taxpayers with taxable income of more than $62,000 are as likely to find economically attractive tax shelters as are single taxpayers with taxable income over $43,000.

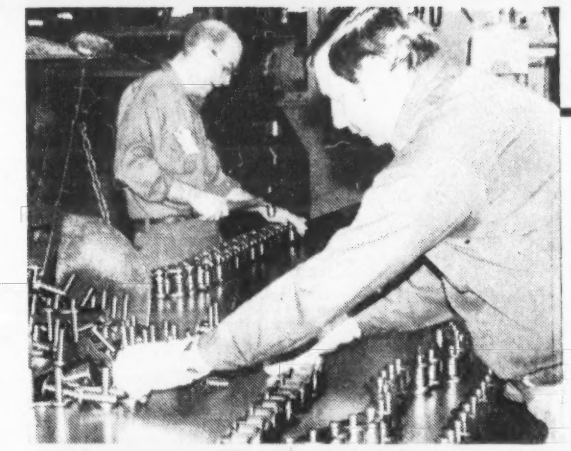


Everything You Wanted to Know About Tax Shelters But Were Afraid to Ask
Lee J. Seidler and
Stewart Karlinsky
1985; 106 pp.
$11.95
from:
John Wiley & Sons, Inc.
Attn: Order Dept.
1530 South Redwood Rd.
Salt Lake City, UT 84104
or Whole Earth Access

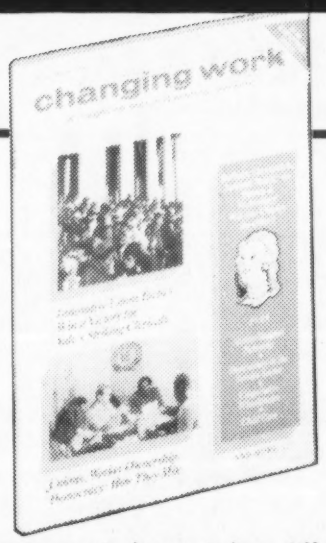
•

If you are willing to treat *your family as a single economic unit* with a common interest in increasing the family wealth, you can create significant tax savings with little or no tax risk.

The key to these tax savings is the transfer of investable funds or income to children or older parents, so that the resulting income is taxed to them at lower tax rates. Capital may be permanently transferred through gifts. Alternatively, certain trust arrangements or loans may temporarily transfer property or income.



Worker-owners assembling chain.



Changing Work
Len Krimerman,
editorial coordinator
$10/year
(4 issues) from:
Changing Work
P. O. Box 5065
New Haven, CT 06525

Changing Work

No aspect of work and the workplace escapes this magazine's eyes — from child care to the viability of cooperatives, from arguments against economic conversion (transforming industries to produce goods with greater social benefit) to a hard look at the Weirton Steel mill where employees enjoy the largest stock ownership plan in the nation.

***Changing Work** is a bold magazine, a magazine for activists, for those who want to improve their lives by making their work more rewarding, fulfilling and responsible.*

—Ken Conner

•

The space industry is less different from other American industries than one might think. It is a heavy industry, with large investments in physical plant and equipment. Its project and product lifetimes are measured in decades rather than in years. It is also a "mature" industry: its projects often have been well-defined for a decade; research is overshadowed by finance and management; and professional, technical and skilled labor staff in the space industry tend to have long employment histories with one company, frequently sharing enthusiasm and commitment to their work that dates back to the Apollo program.

Guerrilla Marketing

I have a business friend who had an extremely successful product. Much of its success was due to its image. The packaging was bright, almost garish, with a well-recognized illustration as its centerpiece. Well, after eight years, that illustration was getting old. It looked dated, out of place in the conservative eighties. Sales were as good as ever, but, he thought, how much longer? What's more, my friend was sick of looking at that illustration; he'd seen it a million times. So he spent a good amount of time, energy and money redesigning the package. The result? Sales dropped off almost immediately.

*My friend didn't read **Guerilla Marketing**. Right there on page 14, Number Three of "The Three Most Important Secrets Of All" is "consistency": "Don't change messages. Consistency equates with familiarity. Familiarity equates with confidence. And confidence equates with sales."*

"Stick with one ad until it loses its pulling power. That's hard for most advertisers. In the beginning, most people will like your ad. Then, you'll become bored with it. Next, your friends and family will get tired of it. Soon your fellow workers and associates will feel ho-hum about it. And you'll be tempted to change the ad." (Does this man know my friend?) "Don't do it!" (Too late.)

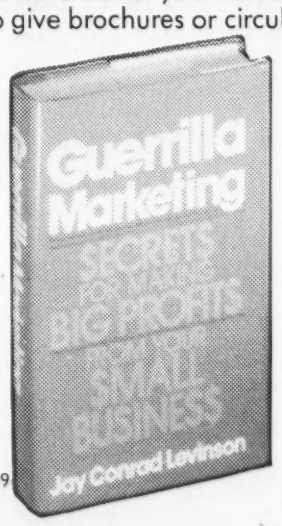
***Guerrilla Marketing** is full of this sort of five-dollar wisdom, full of good ideas on how to successfully promote your business, and without spending a lot of money either.*

—Bernard Kamoroff [Suggested by Bill Huckabee]

•

. . . It is possible to generate word-of-mouth advertising. There are several ways to accomplish this. The first, of course, is to be so good at what you do, or to offer products that are so obviously wonderful, that your customers will want to pass on the good word about you. Another way to get the ball rolling is to give brochures or circulars to your customers. This reminds them why they patronized you in the first place and spurs word-of-mouth endorsements. A third way to obtain positive recommendations is literally to ask for them. Tell your customers: "If you're really satisfied with my service (or products), I'd sure appreciate it if you'd tell your friends." Finally, you can bribe your customers. Tell them, "If I get any customers who mention your name, I'll send you a free gift (or give you a ten percent discount next time you're in)." Which of these methods should you employ? As a guerrilla, you should use *all* of them.

Guerrilla Marketing
Jay Conrad Levinson
1984; 226 pp.
$14.95
($15.95 postpaid) from:
Houghton-Mifflin Co.
Attn.: Mail Order Dept.
Wayside Road
Burlington, MA 01803
or Whole Earth Access



Employee Ownership

ESOPs — Employee Stock Ownership Plans — are hot items these days. To the Left, they represent economic democracy; to the Right they represent worker capitalism; to pragmatists they simply work. Employee-owned Weirton Steel, for example, was the most profitable mill in the country last year.

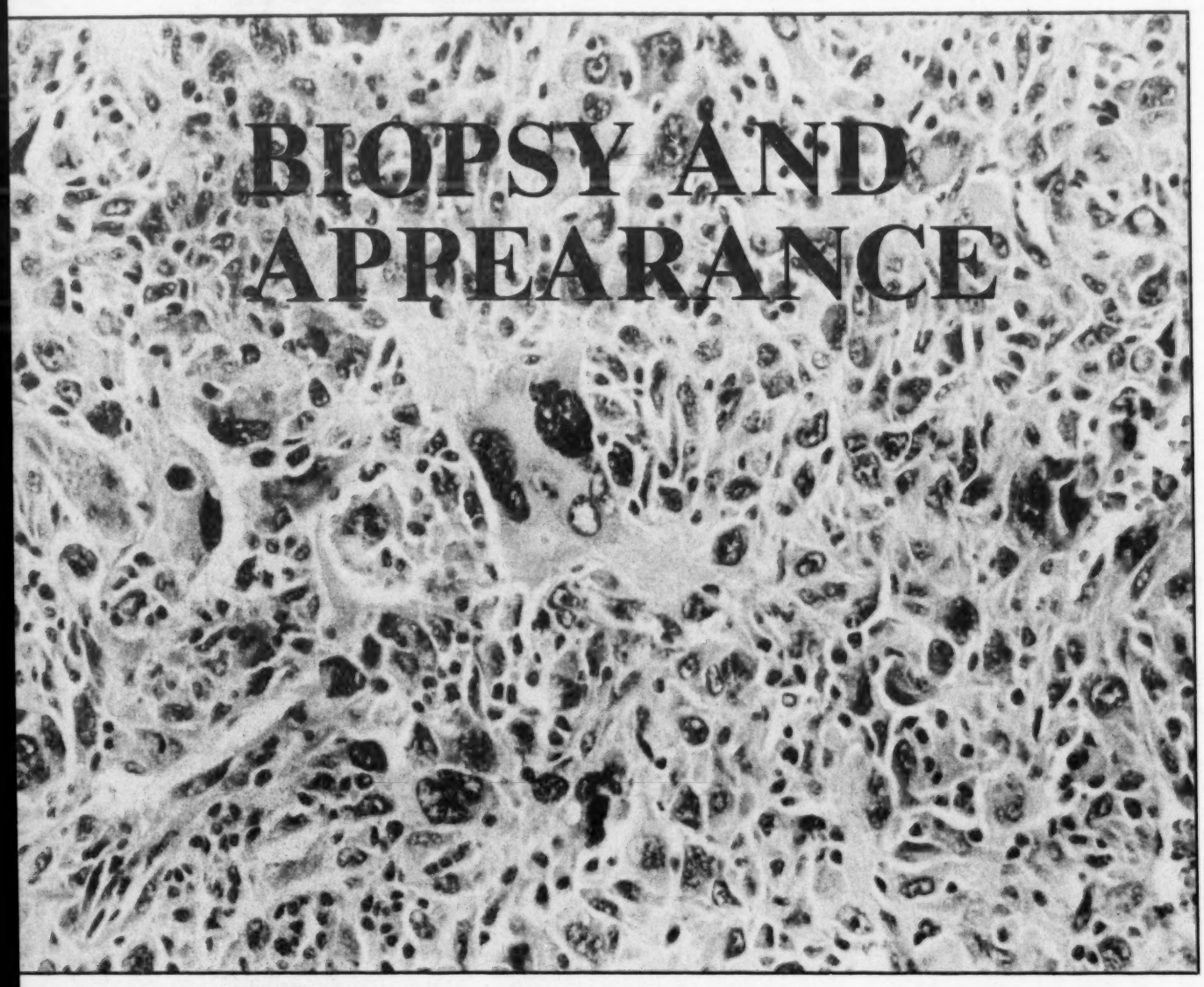
Big ESOPs get a lot of publicity, but it's small business where they are taking off, because Congress has written incentives into tax law that favor transferring stock ownership to employees.

There are now about 7,000 companies with ESOPs, covering approximately 7 million workers, a 25 percent increase since 1981. About 10 percent of these firms are majority worker owned.

This newsletter, published by the National Center for Employee Ownership, is the authoritative source on developments in worker-owned firms. Six times a year they publish research reports, case studies, news on legislative developments, leads on financing sources, and other useful information. NCEO also publishes a resource guide, a set of model ESOP bylaws, and an assortment of articles and books on making employee ownership succeed.

—Adam Blumenthal [Suggested by Steve T. Schenck]

Employee Ownership
Karen Young, Editor
$25/year
(6 issues) from:
National Center for
Employee Ownership
927 S. Walter Reed Drive
Suite 1
Arlington, VA 22204



All photos by Don Thornberry

FIGURE 1. ***Pleomorphic liposarcoma (X200).*** **This field crackles with the features of a highly aggressive malignancy: total disorganization, cells and nuclei (central dark masses) of varying sizes and shapes, varying nuclear staining, and abnormal cell divisions. Giant cells with multiple nuclei are also present. The malignancy is not sufficiently differentiated to be certain of the tissue of origin at this magnification.**

BIOPSY AND APPEARANCE

by Don Thornberry

*"The ideas behind this article were present for some time before they finally took form after reading Sallie Tisdale's article on autopsies (*WER *#41)," says Don Thornberry, a West Coast pathologist. Autopsies peer bullishly into dead tissue; biopsies stare shyly into living tissue.*

—Kevin Kelly

THE TINY, PINK RECTANGLE sandwiched between bits of glass may be no more than a formality taken from an ulcerating, rock-hard mass fixed to the chest wall. It may have come to attention only because of a slight change in skin color or new growth, and been snipped, scraped, or punched out from some easily accessible body part. Perhaps bleeding led to sampling by tiny claws at the end of a serpentine tube passed beyond throat or rectum. The biopsy may be no more than an afterthought, or it may represent the culmination of hours of preparation and life-threatening surgery in quest of a few pinhead-sized pieces of tissue. Preceding it likely are sleepless nights, fear, guilt, and thoughts of impending death or a merciful reprieve.

The emotional trappings are mostly cast off here in the lab. The hundreds of glass microscope slides stacked together each signify what was once functioning tissue, part of a living, breathing whole. They have been cut or delicately torn loose and prepared in a ritualized fashion, the substances necessary for life dissolved away and replaced by others designed to reflect certain aspects of that prior life in a suspended, abstracted death. Shapes and sizes are preserved and colors added, with hues from blue to red representing types and amounts of protein, carbohydrate, and nucleic acid content.

A microscope is the keyhole through which to view this small drama, the eyeglasses worn while traveling this strange realm of flesh and bone, hope and despair. The scenery slides by almost unconsciously. Conversations are held, Robert Nighthawk plays, toes tap, and the view shifts from skin to bowel to bladder to brain.

The Vital Art of Perceiving Cancer

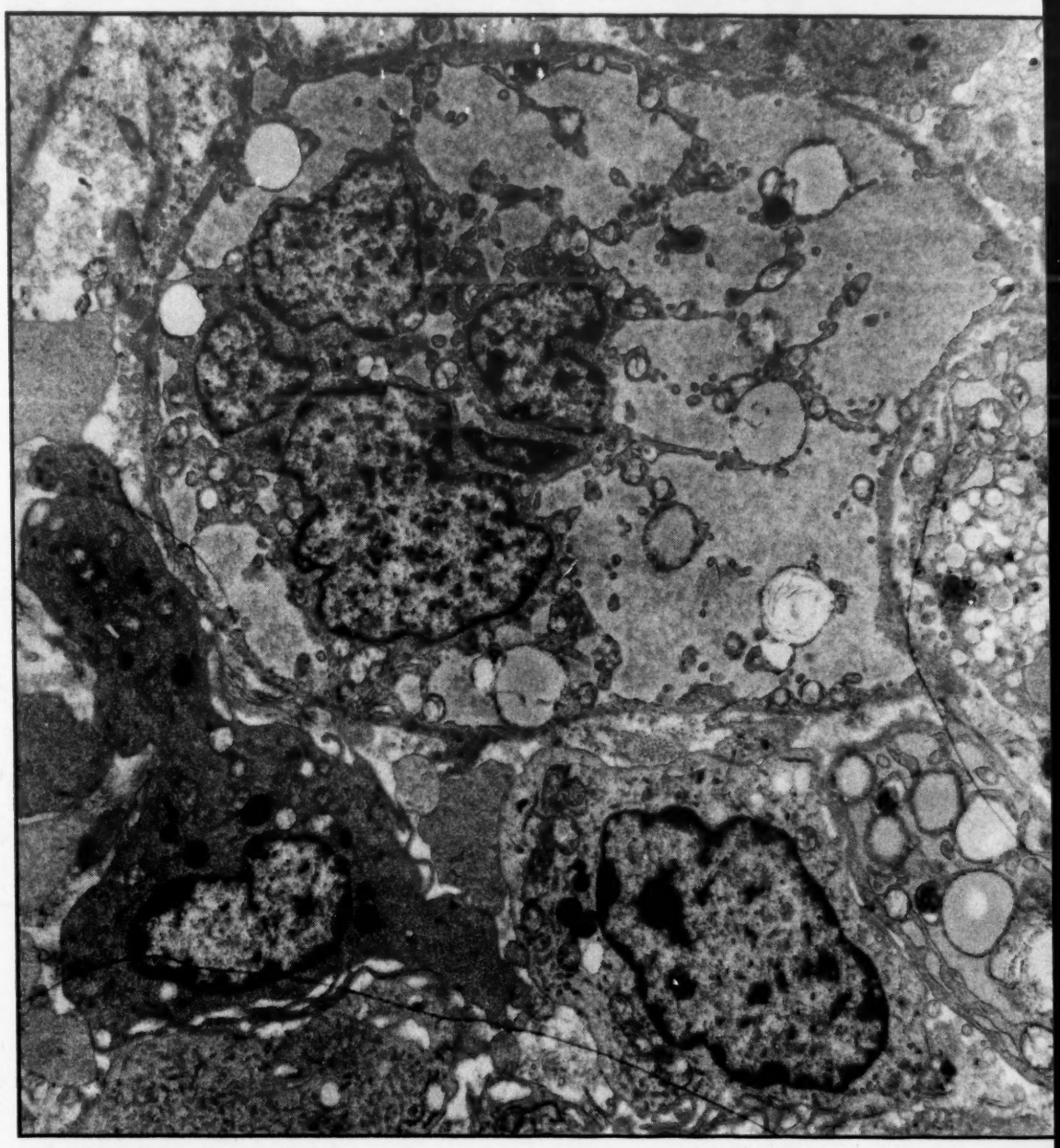


FIGURE 2. ***Pleopmorphic liposarcoma (x5000).*** **Electron microscopy reveals large irregular vacuoles in the cytoplasm (the cell part outside the nucleus) of the malignant cell in the upper two-thirds of the illustration. This suggests a primitive fat cell. The nucleus (upper left) has a bizarre, multi-lobed appearance.**

The study is extremely visual. It is part science, perhaps even more an art. Aesthetics are involved, but are far secondary to the imperative of analysis. The beauty of fine cellular detail, the wonderful arrangement of normal organs and specialized body surfaces are inevitably dulled by routine. I'm attuned to normal appearances only as a reference for deviations. Distractions suddenly fade when something unusual enters the visual field. The real need for discrimination is in the area of benign reaction versus malignancy. If it's malignant, I need to identify where it came from (for example, malignancies turning up in the liver are usually from elsewhere, such as the colon).

Still, aesthetics in the sense of image generating emotion or sensation are not entirely lost. A microscopic field of a full-blown malignancy has a perverse and amazing power and may produce anything from a hollow knot of queasiness to an odd exhilaration. The implication for patient and family may be clear, the prognosis evident, but the painful burden of breaking the news is shifted elsewhere. Here objectivity is needed more than empathy or sympathy.

But objectivity only to a point. In this setting, the image cannot stand entirely apart from the underlying biology. Can there be beauty in the sometimes elegant structure of a malignancy? A few might say yes, but with an argument similar to that by which an atomic explosion may be beautiful if stripped of all implications. Here image is structure is function is behavior is prognosis. A broken link, and the entire chain from biopsy to interpretation to therapy loses significance. The end is purposeful action or inaction, not speculation.

The cell responds to abnormal stimuli by certain subtle alterations of function and appearance. It may simply become an entirely different specialized type of benign cell. With repeated coughing, the delicate, mucus-secreting, bronchial lining cells may become tougher, squamous cells such as those of the skin. Or a cell may go a bit further, abnormal but not clearly malignant. Tumors of fibrous tissue may be quite difficult in this regard; often the clinical history (speed of growth, past tumors, etc.), important in all biopsies, becomes

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FIGURE 3. ***Normal female breast lobule (x160).*** **This is the basic secretory unit of the breast, composed of small nests or "acini" of cells surrounded by fibrous tissue.**

essential to diagnosis. This area presents a dreaded minefield of interpretation. A cell may finally go beyond a merely worrisome abnormality into purposeless, invasive growth yet still betray the normal cell or tissue of origin, such as skin, stomach, or breast. Or the malignant cell may never reveal its origin by pattern of growth, cell size, shape, or color.

The fat malignancy shown here (Figs. 1, 2, pleomorphic liposarcoma) is such a tumor. In this instance, a variety of methods more exotic than simple light microscopy may be used to pry into the nature of the malignancy. Electron microscopy (Fig. 2) looks at sub-light microscopic structures, and various tumor markers based on immunologic reactions identify substances produced by tumor cells, like the protein alpha-lactalbumin in breast cancer.

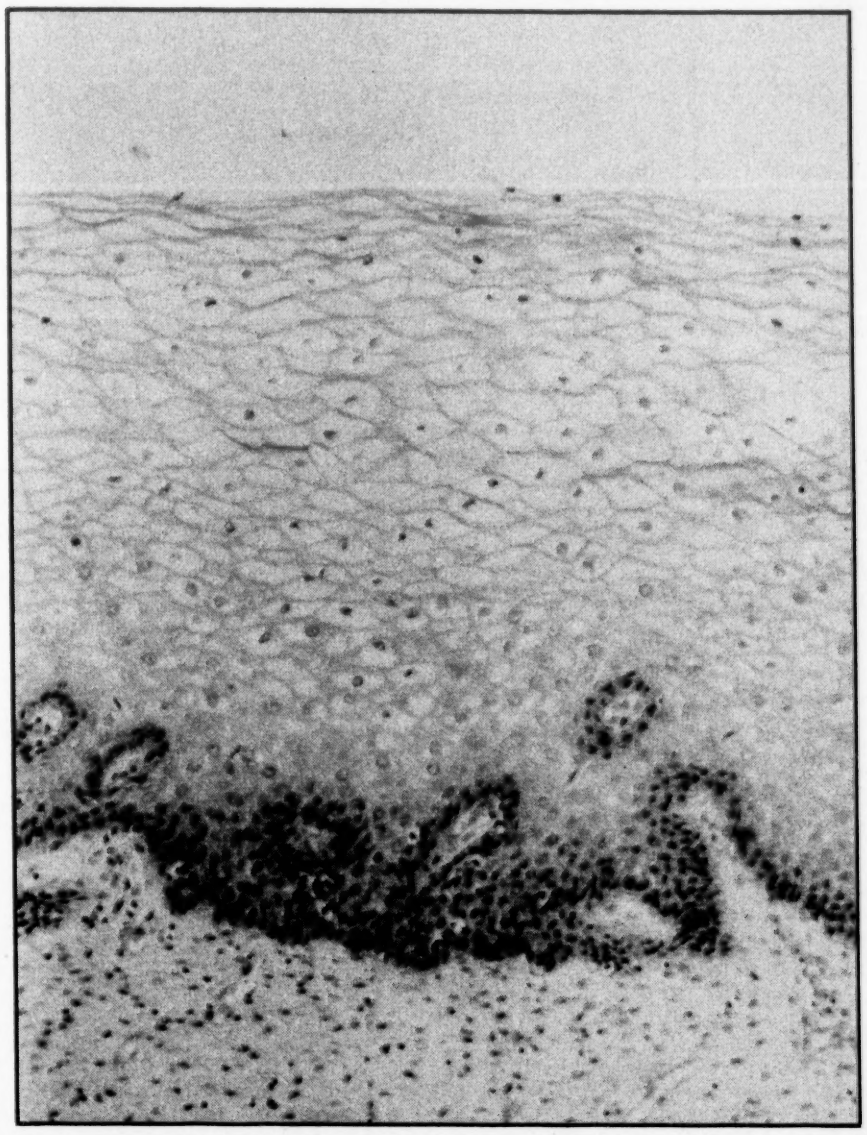
The origin of a malignancy has very important therapeutic implications. Some types are amenable to surgery, some to chemotherapy, some to X-rays, or various combinations. Others aren't amenable to much of anything. A neoplasm with little differentiation into the tissue of origin usually has a poor prognosis. So do those in which the origin is clear but that contain many abnormal cell divisions and highly variable cell shapes and sizes.

The two broad microscopic approaches to tumor diagnosis are by the pattern of growth and by individual cell characteristics, or cytology. Patterns are surveyed at low magnification, like flying at high altitude to assess terrain. I search for such things as misplaced cell groups or a possible breach of surface lining by tumor invasion. The

Normal ▲ Cancerous ▼

FIGURE 4. ***Lobular breast carcinoma in-situ (x160).*** **The acini are plugged and distended by uniform round cells with relatively uncrowded, evenly staining nuclei. Cell divisions are absent. The tumor has not yet spread into the surrounding fibrous tissue. This diagnosis depends upon alertness when scanning at low power.**

FIGURE 5. ***Normal uterine cervix (x100).*** **The outer portion of the cervix is covered by stratified squamous epithelial cells (upper area). The deeper basal layer is dark. All cells are layered in an orderly arrangement with small, uncrowded nuclei. These same cells are scraped off and examined in pap smears. Beneath the surface epithelium is fibrous tissue.**



individual cells of in-situ (noninvasive) lobular breast carcinoma are notoriously bland in appearance. The low power view holds the key: large round cells plugging the breast glands (Figs. 3, 4). This particular malignancy tends to occur bilaterally, and a mirror-image biopsy of the opposite breast is suggested. A well-differentiated, malignant follicular thyroid adenocarcinoma may only be diagnosed when invasion of the surrounding fibrous capsule is apparent; otherwise it may look identical to a benign follicular thyroid adenoma. In other tumors, I need to jump down to minute cellular details: a nucleus (the central dark mass of protoplasm) a bit too large, dark, and irregular; an abnormal cell division; an imbalance between the size of the nucleus and the cytoplasm (the cell part outside the nucleus). Early forms of uterine cervical cancer (Figs. 5, 6) are often diagnosed more on high magnification cell features than on low magnification patterns. With a few tumors of borderline malignancy, the evaluation of a single cellular detail, usually the number of cell divisions, is the deciding factor between a benign or malignant cell.

Every day, dozens of decisions are made that ultimately affect the lives of many people, yet few are aware of what happened to that small part of themselves on the journey from biopsy to the final "lab report" from their doctor. The decisions, of pivotal importance regarding diagnosis, prognosis, and treatment, are made in labs physically and emotionally removed from patient rooms and clinics. Perhaps a bit faceless, but considering the 40 or more people behind a day's slide collection and the dark possibilities within it, the distance is more a blessing than a curse. ■

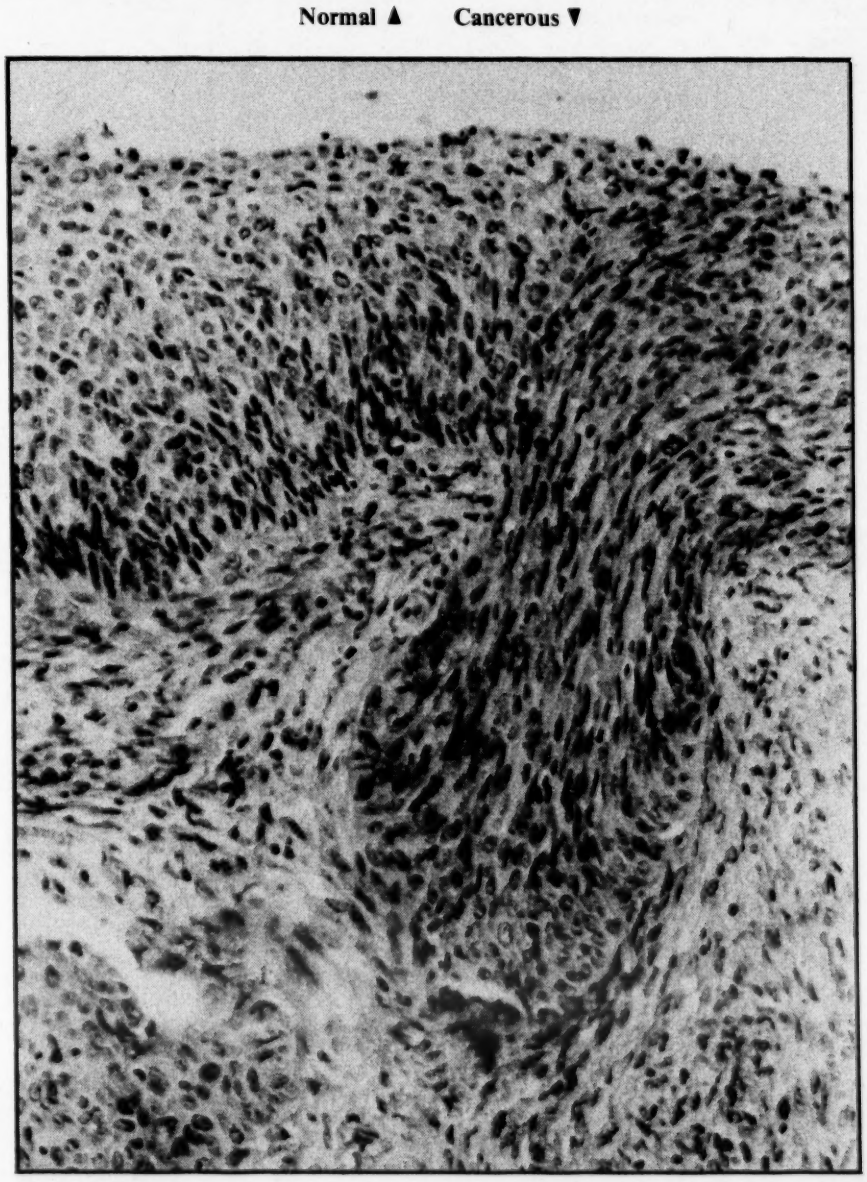


FIGURE 6. ***Squamous carcinoma of the cervix with early invasion (x160).*** **The normal layering of squamous cells is lost. The cells have large, dark nuclei of various shapes lying in different directions. The area at the upper left is in-situ, or noninvasive, carcinoma; on the right a tongue of malignant cells invades the underlying fibrous tissue. The tumor grows within a gland at lower left.**

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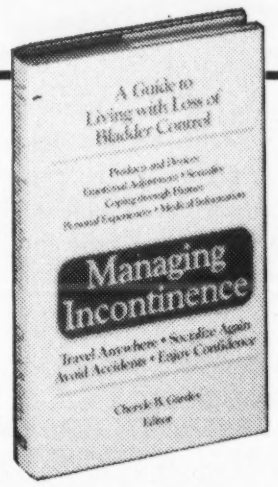

Managing Incontinence
Cheryle Bartley, Editor
1985; 138 pp.
$12.95
($13.95 postpaid) from:
Jameson Books
722 Columbus Street
Ottawa, IL 61350
or Whole Earth Access

Managing Incontinence

Peeing in my pants, aware, but not being able to help it, would drive me to senility quicker than craziness would. This book says there's a lot you can do about it. As our citizenry steadily ages, it's a sure bet somebody you know (if you asked tactfully) could use this face-saving information.

—Kevin Kelly

[Suggested by Rochelle Schmalz]

Male external collection devices.

•

During the Gemini program, despite the inordinate financial and engineering resources invested in the project, urine collection in the spacecraft was a persistent problem. We tried, on a much smaller scale, to emulate NASA's technique of making a custom mold of each patient's genital area to produce a latex garment that would fit exactly. Our lack of success was discouraging but not dissuading.

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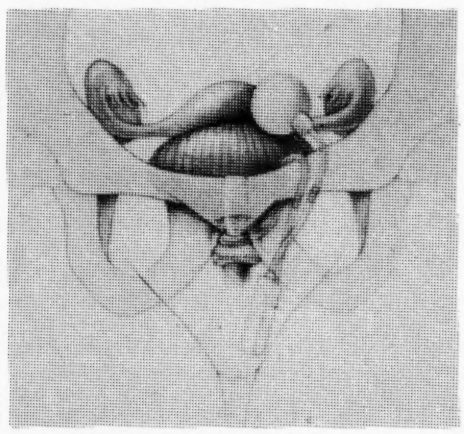
The urinary system is normally sterile, that is, bacteria do not live in it. Normal urine does not have a foul odor.



AMS Sphincter 800 urinary prosthesis: a surgically implantable device designed to control the leakage of urine from the body.

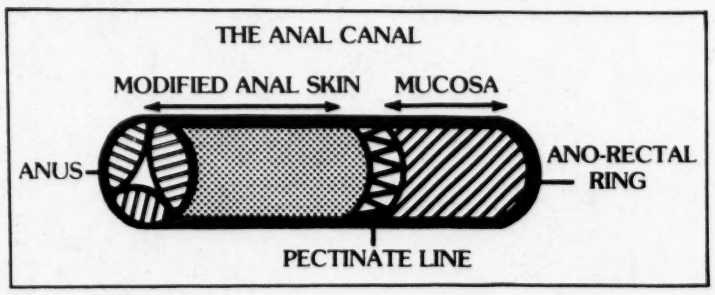
Its usual color is straw to pale yellow, but it varies according to the amount and type of food and drink consumed.

•

Lack of control was a major theme running through all of our conversations. Being incontinent causes people to feel their life is very much out of control. Returning to feeling some sense of being under control was a priority for many. Control is a legitimate human need that can be dangerously counterproductive if it is poorly expressed.

Hemorrhoids

There I stood — uncomfortably — in the Public Library. And thanks to some librarian, I found the advice I needed: symptoms, prevention, amelioration, and cure all in one book. It worked. *—Hank Roberts*



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Beneath the linings of the anal canal is a network of blood vessels, *both veins and arteries*. This network is divided into *three masses, or cushions*. Each cushion extends the length of the anal canal. . . . The unique tissue structure of the anal cushions enables the body to effectively close the interior of the anal canal between bowel movements.

•

The body system for elimination is well-designed and will function properly for a lifetime when due consideration is given to one's intake. Difficulty in bowel-functioning may be a measure of shortcomings in both personal diet and toilet habits.

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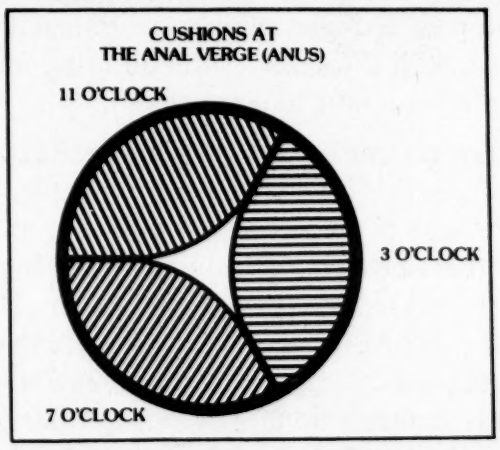
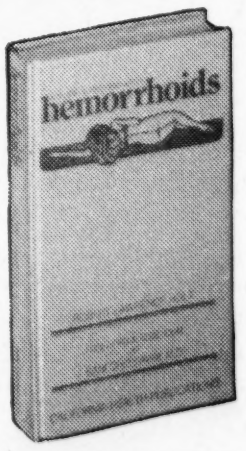
When the stool enters the constricted anal canal, which is swollen from the congested anal cushions, the stool is unable to progress without substantial straining by the



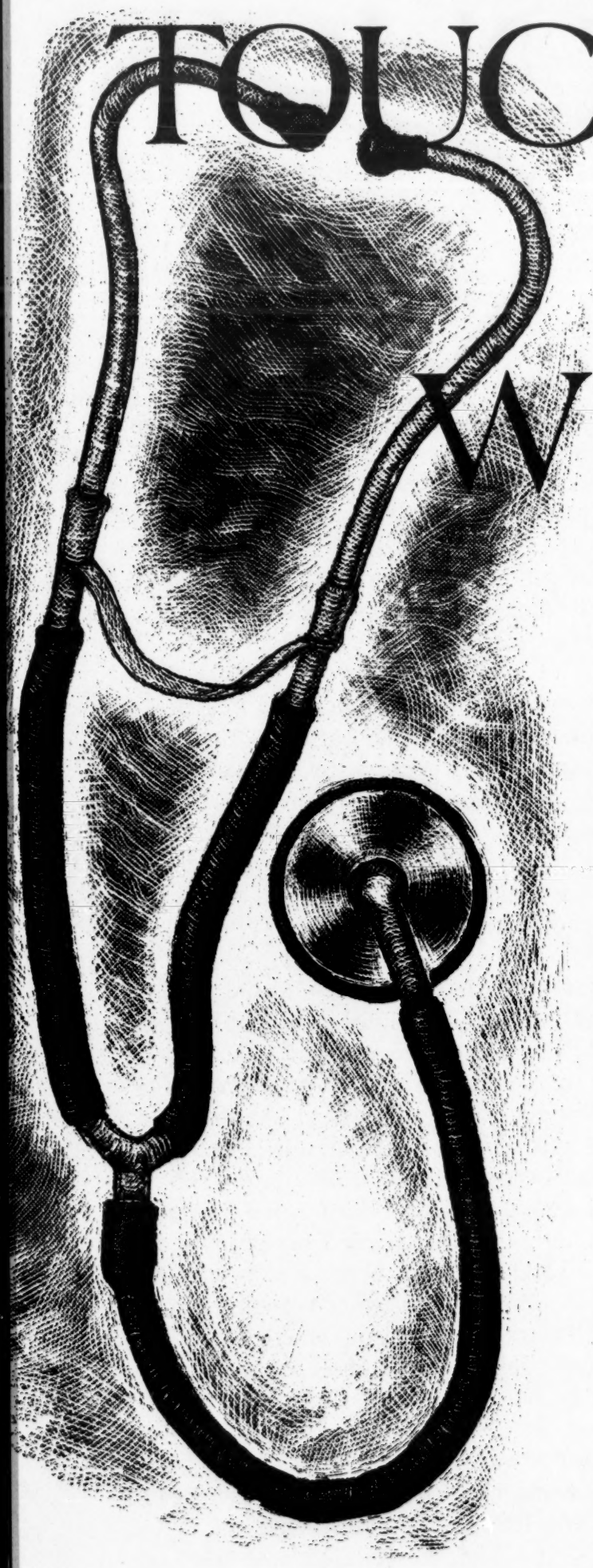
patient. As the stool advances, it pushes the trapped blood ahead of it. This carries a portion of the cushions forward also, and after many prolonged periods of such straining, hemorrhoidal tissue may appear. . . .

For most patients, the progress of the developing hemorrhoid is a long, steady course. It may be many years before dietary deficiencies and habitual straining cause the appearance of hemorrhoids.

Hemorrhoids
Robert L. Holt
1980; 195 pp.
$12.95
($13.31 postpaid) from:
California Health Publications
P. O. Box 220
Carlsbad, CA 92008
or Whole Earth Access



TOUCHSTONE



by Theresa Bacon

illustrated by Kathleen O'Neill

WHEN WE WERE LITTLE MY FATHER CAME HOME from a coroner's call and swept through the house up the stairs. Something was different, something rubbing hard where he was, a blister, that fast, pushing up through skin. Mother knew and she hissed at us — "Your father has been up the road where the big barn burned down. There were two children playing in the straw in the barn. Burns are the worst thing. They died. Don't you ever let me see you playing with fire, never, ever, you hear me?"

My father stutters sometimes when he talks, long swatches of uh-uh-uh-uhuh before a word, then before the next word the same stuckness, and his eyes bat and sometimes close through a whole long saying. Something there is hard for him. I imagine them as kids, wading into the chill Kentucky creek, the slip on a hard sharp rock, his terse older brother: *Boys don't cry.* The back-swallowing.

He is a tall, thin man with great, grey waves of hair, a country doctor's mild eyes, a grey, soft-spoken face. He made housecalls "in the old days," and I would ride along and ask questions, about the crops or my math, then on the way home, about people's sickness. On Sundays we went to the office and he taught me to draw the white penicillin up into the glass syringe, to arrange the enamel tray with catgut, scissors, gauze. His hands never wavered tucking the flap of a toddler's head, making rows of little black ties. I wanted to be a doctor when I grew up, just like him.

Mother notes his back-out-of-the-room walk. Years of practice and he's got it down: the complaints of the ailing jab, like fish-hooks, with each word of advice and assurance he steps back, out, on to the next.

What a tower he has seemed to me. He was 31 when I was born, their first. All those years between us. He says little out loud. He never mentions the war except to say he was a doctor in Germany. —Were you ever shot, Daddy, were you ever hurt? —No, but I sure patched a lot of them up.

He has a passion for gadgets. He likes what he can fix; I think it calms him. When the lawnmower clutches and gags he spreads the blade and ringwashers out in the order of their assembly and pokes till he gets to the chipped piece or tangle of sock. You can see him steady, absorbed, as he gets the machine to purr again, gutless and smooth.

Some late nights I'd be up and hear him come down to the

Midwestern in the way raging silences connect events, this prose reaches out of poet Teresa Bacon's growing-up in Ohio. She now makes and teaches poetry in Berkeley, California. —*KK*

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kitchen, crack ice, pour scotch, sit at the round table, the light down. Many nights in a row sometimes, his face in the day becoming more enormous and complex and withdrawn, more mountainous, his eyes as complicated as granite with rifts and niches of shadow. I don't often see him show love, the way in a woman's face tenderness will wash over, unbutton her. I see him sometimes smile, the smile going deep inside, and sometimes relax, as if he had set something down.

When my friend Mag was killed in a car wreck and I came home shot to pieces with it, my father ran out to the driveway to meet me and wrapped his arms over my shoulders and sobbed, Poor Mag, poor Mag. My father the coroner who has signed papers for so many broken necks on so many country highways, I knew he felt her neck in his hands, saw her blood and her wreckage, and for a moment felt what he saw. It is the only time I have seen him cry.

The headache presses out to the rim of my skull, to the baseline, the headache of what all these years I've never been able to say. When my clothes caught fire in the basement and I flamed through the house, you were gone, out. Mother yelled at me to roll. Uncle Bill said —I've never seen your father like that, the color shaken from him, wrecked, his hands up and down. But I did not see you. In the emergency room, only a haze in the corner far away where I sensed my dad. I did not see you, after your syringe filled up, wanting to absolve me from pain, and all during the months of bandages, your words reassuring the scientific faction of my mind about epidermis, nerve endings, scars, together we erected a soundproof room where the nightmare could scream its lone sound at the dumb dark glass, nightmare, my skin Daddy, burn.

Where did you go? I was not wanting you to make it all better or make it go away, or if I was, right there you could have begun a new testament, saying No, I cannot take this from you, or for you, or touch it, and then you could have stayed, with Mother, to hold my hand, to stroke hair back from my cheek, whispering over and over Pray Theresa pray, the prayer coming out all one breath Hail Mary full of grace the Lord is with thee, all of us together becoming boats for me, rocking.

I felt he could never hear me. At 17 I lay in bed for three weeks, not speaking, the doors locked to my room. I said I was sick. I would not go to school. I stole into his textbooks and adopted "schizophrenic" for the desperate jazz speed of the sound. I bit my nails completely off. When he came in I stared past him.

He sat down. Cruel, deliberate, stony, he said —You will go to school. Tomorrow. You are not sick. There is nothing wrong with you. I said I wanted to see a psychiatrist. He shook from whatever he was holding back to keep himself even, so he could repeat it exactly a second time. I had him stumped. I was bitterly glad.

That same year I threw up from a bad hamburger, passed out with my hair and face in it. Anyone would have reacted as he did, shouting —Couldn't you have made it to the bathroom? You can't just lie here in this mess. Get a towel, that rug is a mess! Anyone would have thought it as foul . . .

I'd gaze for hours at his medical journals, the bright color photographs of cancer of the tongue, the lovely drawings of blood cells specked with disease. I'd ask him questions — and this was his element, what he knew, what he could explain — and the material was beautiful to both of us, and we could share our fascination. But for me there are so many other things inside. I'd try to talk to him about Vietnam, about the bomb. Always we ended with the obligatory scene, the daughter quaking at the kitchen sink, trying to make the bow of her passion aim the words in a straight line, him deflecting, the shape of each arrow distorted into uselesness. Or the arrows snapped across his knee with great grunts. I evaporated, silly as rickrack. Him in his white surgical coat. Oh tower.

Once he said to me there were a couple of years when he felt . . . Nothing. He said —You can get to that, sometimes. And he looked very grave and his head dropped slowly, as if some heavy ceiling were lowering.

Hidden, pushed to the far back of the den closet were the *Life* picture books of the Second World War. I had the dreams about the fields before I ever opened the books. The day I opened the books — I must have been about 10 — the black-and-white photographs were more horrible than the dreams: the contorted bodies, dozens of hapless skulls laid like garden rows of cabbage in front of the high wall of arms in a mass grave, for which I got so sad, so sad, the heads off from the hearts. And men driving the tractors, pushing the carts, standing around; live men, undistraught, doing their jobs.

I put the book back. I doubt I breathed or spoke. At dinner I couldn't eat. He asked what was wrong. Nothing came out. How did I get from the books what the pictures were. Then my arms clinging so tight around Daddy, Daddy, crying that I had seen it and it was so awful and I was so scared. And he said, It is okay, okay, the war is over now the pictures can't hurt you. The war is over and it can't hurt you.

His love, his wish; his guidance: Put a fence around the yard; have a textbook for each injury. Should I still be angry? He has been a witness to many accidents — he shoves away, buries, turns under. He stomps. Yet in the garden there are broken Coke bottles, green live worms, fractured bits of animal bone. My mind is composed of as many factions as his — I learned it from him. The war between the parts is the deepest disturbance in me. ■

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SOME SAY THE WORLD WILL END IN FIRE," wrote Robert Frost. For some of us, it does. We are drawn to flames, punish with fire, and revel in it. War is fire and so is execution, the pariah strapped into a chair that vibrates with electric flames. Millions are burned to ashes after their death; the Hindu wife is thrown alive onto her husband's pyre, her only hope. We burn witches and heretics at the stake, to cleanse them; we dissolve waste, the unwanted, in baths of acid. A mother, driven to distraction by her child's crying, dips him in a tub of scalding water, tosses a cup of hot coffee in his face.

Fire is both joy and pain — it warms us, cooks our food, grows our crops. "Among all phenomena, it is really the only one to which there can be so definitely attributed the opposing values of good and evil," wrote Gaston Bachelard, the philosopher. "If all that changes slowly may be explained by life, all that changes quickly is explained by fire."

A group of recovered burn victims calls itself the Phoenix Society. Each year two million Americans are burned; three hundred thousand are burned seriously. Their unchosen pain becomes a source of teaching: for the unburned to repeat, observe, approve. It is pain as a religious joy, as a religious damnation. Whether the outcome will be ruin or rebirth for any one of these lightning-struck innocents is impossible to predict: destroyed by fire, the past disappears, and the future becomes a new world on the other side of the tunnel of the burn unit, through which the victim must crawl all alone.

*People cope with what they fear in different ways. Sallie Tisdale, registered nurse, mother of three, is an intrepid trekker into the taboo territories of mortality, illness and death. She deals with what she dreads by elucidating the monster in the most intimate detail (see her tales of autopsies [*WER *#41, p. 4] and Alzheimer's Disease [*WER *#43, p. 22]). Burning, a terror that swells upon mention of the word, is one of the ogres she expounds in her new book* The Sorcerer's Apprentice: A Nurse's Tale of the Modern Hospital, *to be published in April by McGraw-Hill ($15.95 postpaid from McGraw-Hill, Princeton Road, Hightstown, NJ 08520). We excerpt with permission.*

—Kevin Kelly

Relatively few hospitals have specialty burn units. In those that do, the burn unit is the hardest place to enter, the most guarded, the most protected. A friendly surgeon may take a visitor by the hand into the operating room, a class of psychology students may forage through the pediatric floor; but few visitors get into the burn units out of curiosity. In part, this is because of the urgent need to prevent infections, but it is more than that. No casual wanderer would be glad to stumble across the burn unit unawares.

Burn treatment is, with rare exceptions, the most extensive treatment medicine offers, and often the most expensive. These uncommon beds start at over $1000 a day, minus the frills. In the burn unit, terrifying and exquisitely painful procedures are done in the name of healing; hideous wounds are repaired as best they can be. It is hard to watch, hard to hear, hard to do.

Burn patients are wrapped in white — muted, stilled, suspended. They are attended by people in green and yellow suits, hair caps, shoe covers, masks, indistinguishable by sex or intention. The two societies mingle in an exclusive club, a family of initiates, a world removed. There is a muffled quality to the machine sounds — the whoosh of ventilators, the beep of monitors — broken by

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by Sallie Tisdale

moans, words, the hush of double doors sighing open and closed, an occasional cry or scream. And unlike the creeping cataract or growing tumor, burns appear suddenly, abruptly, without warning. The injury becomes a crucible, and the burn unit a proving ground.

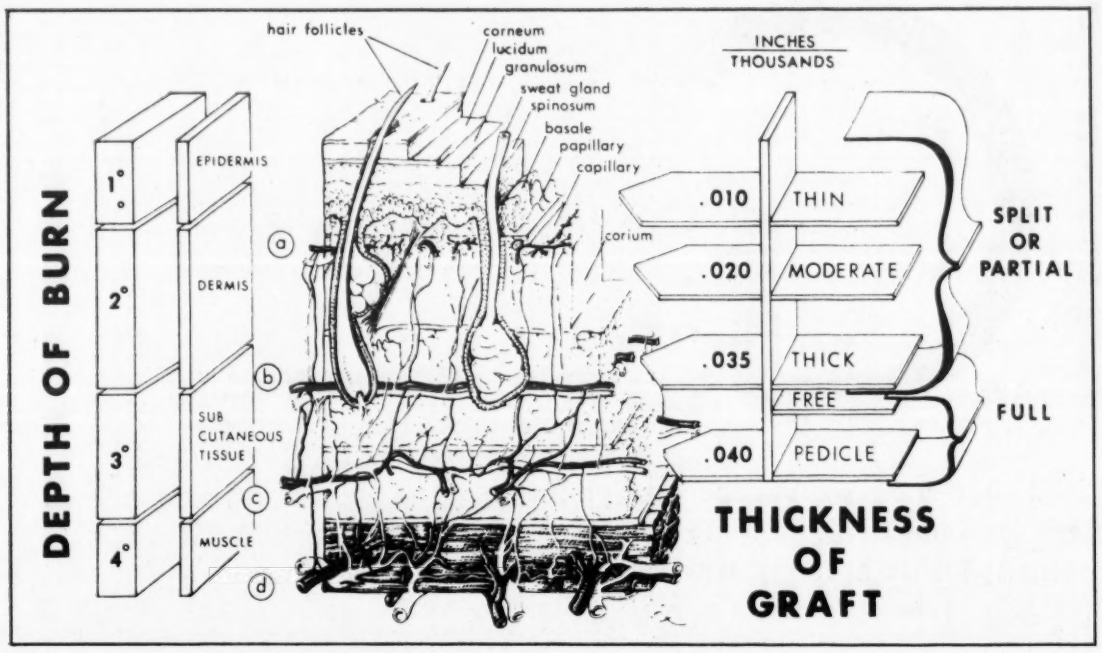
A major burn is possibly the worst thing that can happen to a person's body, the worst of all physiologic catastrophes up to the point of death. The treatment is fraught with oddities. Our skin protects us from infection and ultraviolet rays, helps to balance bodily fluids, and provides much information about our environment. Without skin, the human body becomes frenzied and confused. Without skin, the fluids mix and shift, fleeing vital organs and then filling them, changing blood pressures and chemical compositions rapidly, disastrously. A large burn can evaporate almost three liters of water every day. Burns "bleed white," draining precious quantities of salts, proteins, and nutrients. Untreated, a person with major burns will die of shock in a few hours. In the desperate metabolic rush to stop the steady flow of fluid out and the tide of shifting waves within, the body becomes catabolic, eating its own protein mass. Even after weeks of seeming stability, a person can suddenly sour and die.

Life

Loss of skin is more than a physical disaster. It is the loss of our point of contact with each other and the world, with our shape and form, our view of ourselves — and others' view of us. Burns remove the borders we use to take up space, define our shape, push air out of the way. The helplessness that follows goes beyond the extraordinary dependence on nurses, doctors, and machines; it is a helplessness of spirit, self, identity; it is like a death.

The first hours of a burned person's new life are taken up by "resuscitation," the clearing of pathways for air, the focused beating of the heart. Then the team of physicians and nurses settles into a complex routine of care, which will often last for months. The hole in the body must be plugged, or else we drain away. In the days after the injury, the dead skin and muscle shrink and the tissues swell with fluid, and if a limb is surrounded by burn, its entire blood flow can be squeezed shut. They call this "circulatory embarrassment." Then the burn must be sliced open down its length, like splitting a hot dog before cooking so it doesn't bubble and burst. A chest embraced in this way by dead tissue — called "eschar" — may be sliced with an H or other design, like Zorro cutting his enemy's silken shirts. These cuts don't bleed very much, don't hurt much; there's too little left of blood vessels and pain fibers. This shrinking, too, can pull up joints short and tight, ending motion, making seams and seals where there were none before; between chin and chest, between lips, between eyelids.

Severely burned people have a metabolic need beyond that of



Cross section of skin depicting blood supply, depth of burn, and relative thickness of skin grafts.

ordinary people. Without aggressive nutritional support, the person drops pounds in hours. A not uncommon requirement is 5000 calories a day and many liters of water, carefully balanced and calculated. This is many times the average adult's needs, enough to kill a healthy person if he or she could gag so much food down. Where to put the needle for an IV, the tube down the throat to the stomach, when skin, muscle, and blood vessels are charred away? With the best of care, the nutrition can be inadequate, despite odd mixes of fats and amino acids that taste like syrupy chalk and pour out sluggishly like thick glue.

The burned person is a greenhouse for bacteria, a ready source of dead meat and fresh blood, immobile and compromised. Opportunistic bugs find their way sooner or later into the most controlled units, and that's trouble. Then skin grafts slough off, lungs fill with fluid, bowels run with diarrhea. Antibiotics can kill here, too. In the first hours of shock from the twisting rivers of blood and tissue fluid, the internal organs can be damaged as their oxygen supplies are cut off in the rush. Kidneys are particularly sensitive, and with a damaged kidney, prescribing drugs becomes a tricky procedure. Every manifestation must be deftly parried, like unexpected obstacles appearing on a desperate course. And before long comes the pain, like a sudden Arctic wind on an August day, knocking you over, leaving you breathless and scared.

Twin boys, fifteen months old, and their father, who pulled them from a burning house. A young pianist, his dominant hand destroyed by flaming oil. A 16-year-old girl roasted when a church barbeque exploded, killing her boyfriend. An infant with a scalded face. A 44-year-old woman who drank Drano, her mouth a swollen black doughnut. A young man trembling in bed, incoherent, who soaked himself in kerosene to blow himself up. A housewife who spilled a deep-fat fryer and slipped in the grease, falling into the puddle and lying there, unable to rise because of an injured back. A two-year-old boy burned in the house fire that killed his mother. A 30-year-old woman pulled from a burning house, who weeps for her lost face. This is heartbreak, this is tragedy without a shred of sentimentality, without room for romance or morals or poetry, no room for anything but a speechless wonder. Like the lost, dead love of Galatea, "I rage, I melt, I burn."

Jered, one of the twins, is almost dead. He arrived with 67 percent of his body burned, most of it "full-thickness" — what used to be called third degree. The skin, fat, muscles, blood vessels, and nerves are all destroyed in a full-thickness burn, cooked like the white of an egg. Such burns, with the nerves gone, are curiously painless. Jered had the imprint of a baby blanket on his forehead, the ribbed pattern burned into his scalp, and his airway was filled with soot. He may have been poisoned by the nylon fumes of the burning blanket. His brother Michael is burned almost as deeply, but Michael's lungs are almost clear, so he has a much better chance at survival.

Jered is doped with morphine and Valium to keep him from fighting the ventilator that breathes for him. "I think we're going to get them both well," says the medical director, a surgeon, "but it's going to be a case of zero mistakes."

A curious fact of house fire burns is that one need not be touched by the flames to be so badly hurt. Jered and Michael were pulled from a bedroom not yet burning. Houses on fire grow extraordinarily hot in a few short minutes — 1200 degrees, 1500 degrees Fahrenheit — and the skin chars and crisps away as though it were in a kiln. Our homes, our most precious belongings, are the worst kinds of poisons: upholstered chairs, paint, rugs, mattresses all smolder with toxic fumes that can mix with the water in the lungs to form acids — simple acids that burn from the inside out.

In a room separate from both his brother and father — to prevent infections — Michael

is awake, angry, and bewildered. All was well a few days ago; whence came this sudden change? He mews and whines in his crib, face buried in the sheets and diapered bottom high in the air, trying to escape his restraints. He is being fed by an IV in his ankle and a tube down his nose into his stomach, and his toddler scrambling could easily dislodge the precious tubes. Therefore, he is bound to the bars of the crib. He waves his thickly padded arms and tries to struggle with the nurse who comes to turn him. Twice a day his dressings are changed — in the tank.

The tank is the dungeon, the bright, tiled room of dread. Michael's nurse Linda tells me about a recent patient, a middle-aged woman. "She couldn't sleep at night because she dreaded the tank. The first thing she'd say to me in the morning was, 'Let's get it over with.' It was terribly painful for her. Then she'd spend the rest of the day thinking about how many hours until her next tanking. When I'd bring her pain medication to her, she'd say, 'Oh, now it's only 30 minutes until I go in the tank!"

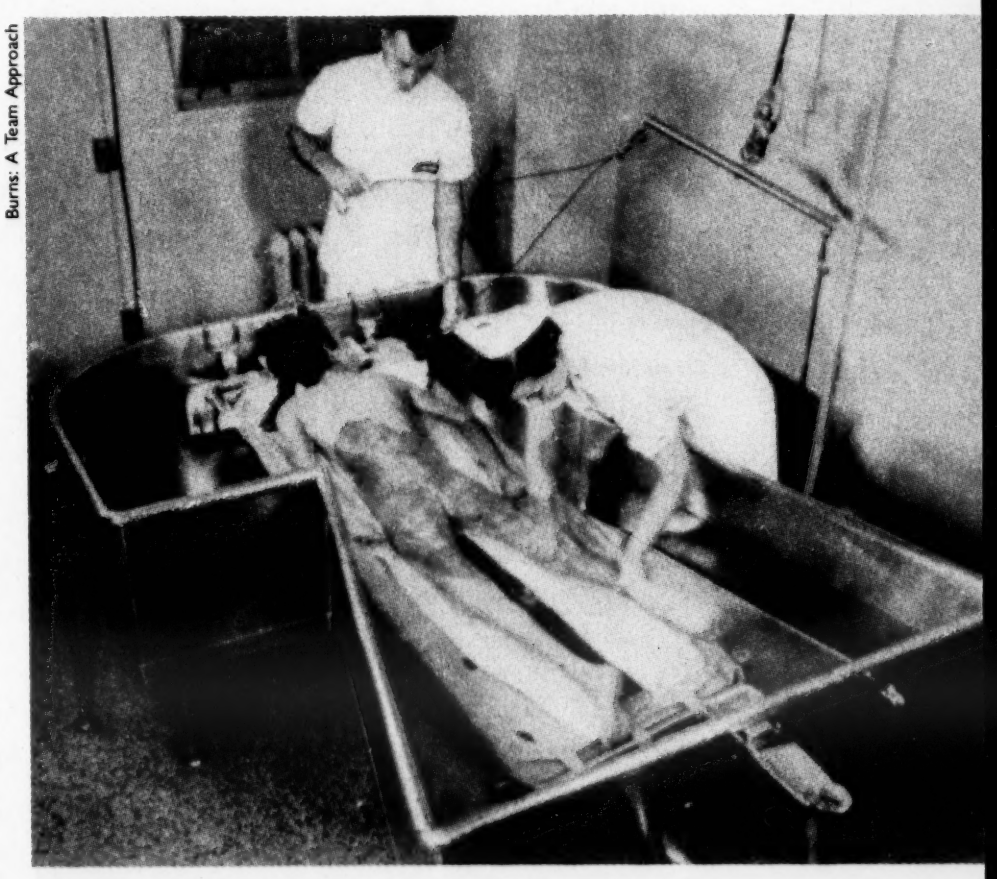
The tank is out of vogue in some places now, but it is standard procedure at this particular unit, one of the largest and most respected in the country. Almost every patient here will be tanked for at least part of his stay, some twice daily for many weeks.

The tank or tub is often a stainless steel table with high sides and drains, not unlike the tables used for autopsies. Other tubs are like giant shiny spas, many feet wide and long and deep enough to soak in. The patient is either scrubbed and showered with a nozzle or soaked in water, to help peel off dressings, wash off medicine, and soften the dead skin, which must be cut or shaved off. Patients are immediately tanked when they arrive from the ambulance, to clean the wounds and protect against infection. It is often the nurses' job, when they bathe, to take forceps and knives or scissors and pull up patches of dead skin and muscle, clipping until the wound is clean. A full-thickness burn is painless, but when the edges begin, ever so slightly, to heal, the fresh new pain fibers are electrically sensitive when exposed to air, washed, touched, scubbed. All partial-thickness burns — first and second degree — are exquisitely painful from the beginning. Remember grabbing the pan without a potholder, pulling back in pain before the realization is conscious? Remember the angry red, the blister? Imagine two-thirds of your body.

Even with burns covering 95 percent of the body, people are often lucid when admitted to the hospital, some even euphoric before lapsing into unconsciousness. Patients don't realize how badly they are injured because at first there is no pain. All the fuss seems unnecessary, overwrought, a bit silly. But with time a dream state of dissociation begins, separate from the experience, and it can be either a happy fantasy or a repetitive nightmare in which the crisis is relived again and again. Some recovered patients cannot remember the first few weeks of treatment and critical care. Pain without memory. Is it real?

Time for Michael to go in the tank. He is carried into the room fully bandaged. I wheel his IV pole behind. Three nurses gather round the tub, masked and gowned with sterile gloves on, as though in surgery. Using scissors, one nurse begins to cut away the thick gauze around his chest while another unwinds the roll around his leg. I can't tell who is who; I open packages when supplies run out, hold a bandage so it won't unfurl.

As his dressings come off, Michael begins to roll from side to side, struggling to get on his hands and knees, away. All three nurses work to hold him still. As each limb is exposed, the skin is scrubbed with antiseptic soap and showered, two and three times, and patches of dead skin are clipped off. I try to stroke his head, greasy with ointment and sweat, and he seems unaware of the attention. I feel shocked, cold, like a victim of unexplained violence. His hands, his feet, his face are all badly burned. He wiggles and cries in a steady ululation, alien, growling through a smoke-sore throat. ►



The burn patient is lowered into the "tank," properly called a Hubbard tank. The swirling waters simulate motion and keep the grafted areas clean.

Treatment of Burns

Patient wrapped in silver nitrate dressing.

Once the wounds are clean, the nurses slather a white antibiotic cream called Silvadene in thick coats all over his body, wrap whole rolls of soft gauze around each area, and then cover his legs, arms, and trunk with mesh gauze (Stockinette), a highly elastic cotton tubing that can be cut and shaped like clothing to hold the dressings in place. Each finger and toe is painstakingly separated and wrapped singly. Ties cut off surgical masks are used to bind the Stockinette pieces together until, almost an hour after beginning, Michael is clothed from head to toe in a thick, mesh-white bodysuit with small holes for his eyes and mouth. He waves his arms, padded oars, helplessly. I ask Linda how long before his next tubbing. She laughs: "You're just like my patients! Don't dwell on it." In eight hours the process will begin again.

Now Linda holds him. She sits in a wooden rocking chair around the corner from the open door, with the lights down low, and pulls the bound boy up against her uniform. She whispers to him through her mask. Linda is trying to get pregnant and is afraid she might be infertile. Michael quiets, stills his movements, and presses his face tight in between her breast and the arm which encircles him.

A full-thickness burn of one-inch diameter will take over three months to heal spontaneously. Because of these exceedingly long periods, all full-thickness burns and many partial-thickness burns are closed surgically. One method, especially for smaller burns, is called "excision and closure." In surgery, the entire burn is excised — cut out — and then neighboring skin is pulled over to close the wound much as a regular surgical wound is closed. There is the chance for considerable loss of blood in such a procedure. Most large-area burns are closed with grafts, to plug the hole through which life drains away.

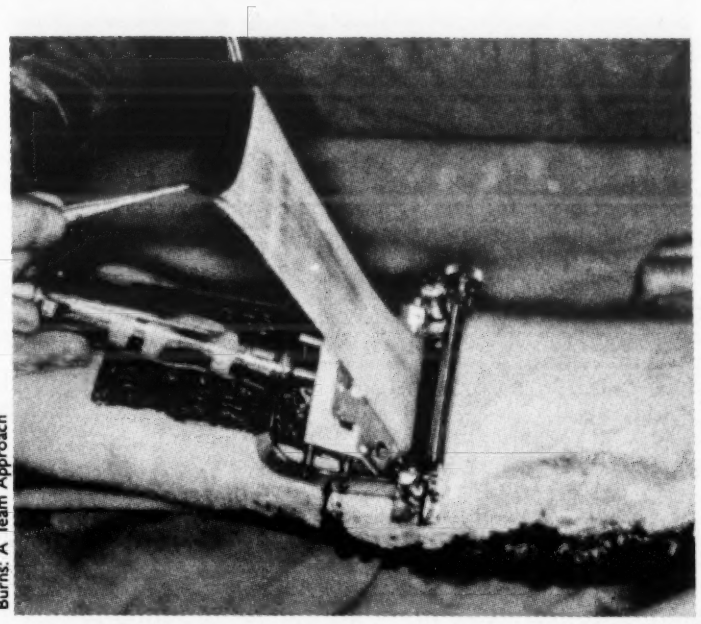
Grafts take three forms: xenografts, from another species (almost always pigskin); homografts, from cadavers; and isografts, the patient's own skin. There is an odd exception: someone who has had a bone marrow transplant in the past may develop an immunity against his or her own skin and only be able to accept the bone marrow donor's skin. So far the search for a good artificial skin has failed; nothing shares the porosity and elasticity of human skin.

Pigskin is cheap, considering; a patch about three by four inches costs around $13. The skin is harvested in the slaughterhouse and bought by hospitals in sealed packages, frozen or dried. The same size patch of cadaver skin costs $59, because there isn't as much to go around. Organ donors don't usually think about skin when they agree to donate their own or a dead relative's body parts, and they often refuse when specifically asked for skin. The idea causes disquiet somehow. A skin bank technician tells me that this is why they always try to get blanket consents for *any* organ.

His is a specialized job. He is in charge of removing the skin from dead bodies once permission is obtained, a procedure called harvesting. It must be done within hours of death, 24 at the most if the body has been refrigerated. He and his assistants will travel hundreds of miles on little or no notice to harvest. He keeps the skin in a heavy square freezer in a corner of his office, stored in liquid nitrogen at extremely low temperatures. You handle this smoking material carefully, with gloves: it burns.

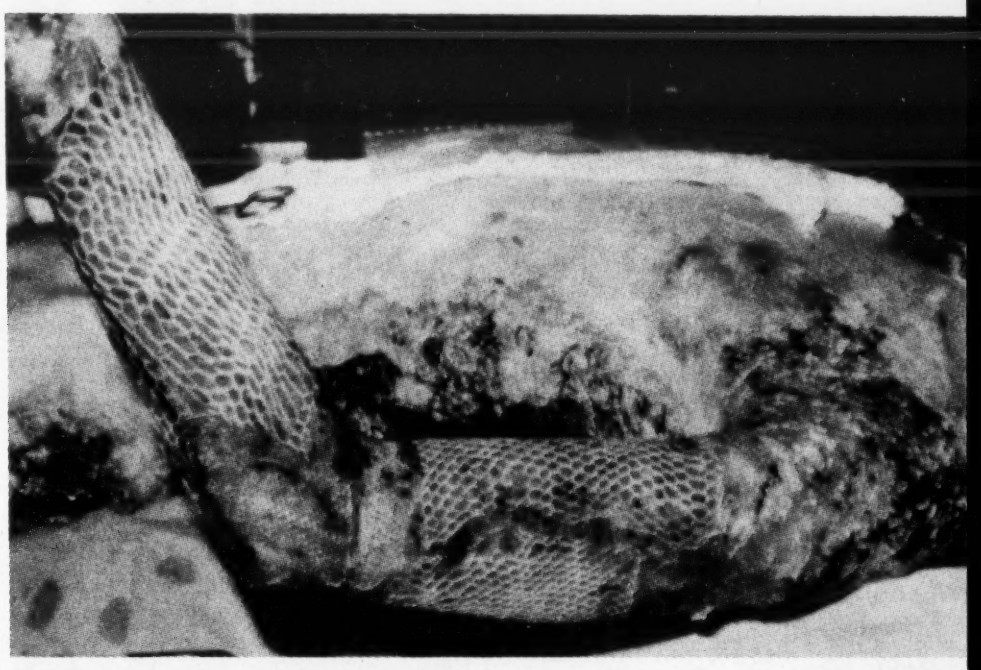
A person borrows the skin of others only briefly. The body rejects it the same as if you tried to sew a gauze bandage on and call it fur. No one's fooled. Pigskin and cadaver grafts will stay in place several days, covering the wound until the cells begin to regenerate (in a partial-thickness wound) or a victim's own skin can be harvested for a permanent graft.

You go to your grafting surgery a sheep to the fleecing. The skin is removed, delicately, with instruments called dermatomes and dermabraders. Manual or electric, large or small, they are like souped-up cheese slicers. Gloved hands slide the



Burns: A Team Approach

An air-powered dermatone shaves an ultrathin fabric of living skin off a healthy leg to graft onto the burn area.



Burns: A Team Approach

To extend preciously-acquired grafting skin, the tissue is sliced in a net pattern and expanded as a mesh over the burn.

knives along and peel the skin off in fine transparent sheets. Split-thickness grafts, most common, are simply the fragile top layer. Deep split-thickness and full-thickness grafts are thicker chunks with better blood supplies, promising better cosmetic results for faces and hands. Oh, those anatomic apportionments of the skin we hold so dear.

Weeks from now, when the sites are healed, they may be stripped again — and even again. Almost any part of the body can be used, including the scalp. (To graft an eyebrow, of course, one goes first to the scalp and its hair follicles.) If only a little unburned skin remains, the graft can be turned into mesh in a machine called a skin-expander, stretched to a great size, and laid along the wound like a net stocking. New skin grows between the wickerwork, forming scars of lace.

"I never get bored," Linda tells me. "What I get tired of is causing pain." But the pain — that is the point.

Luke is a 25-year-old man who tried to kill himself three weeks ago. He removed all his clothes, poured kerosene over his body, and ignited it. The flare must have been glorious. He came to the burn unit with 65 percent of his body burned, almost all of it full-thickness. This is at the edge of what is called "unprecedented survival." Because Luke is young and otherwise healthy and because his lungs were only slightly injured, he has a chance. He arrived coherent enough to say that he had tried to kill himself, and since then he has been almost completely nonverbal, apparently delirious. The first paper in his already thick chart is a detailed discussion of the state law allowing medical care for "incompetent" adults.

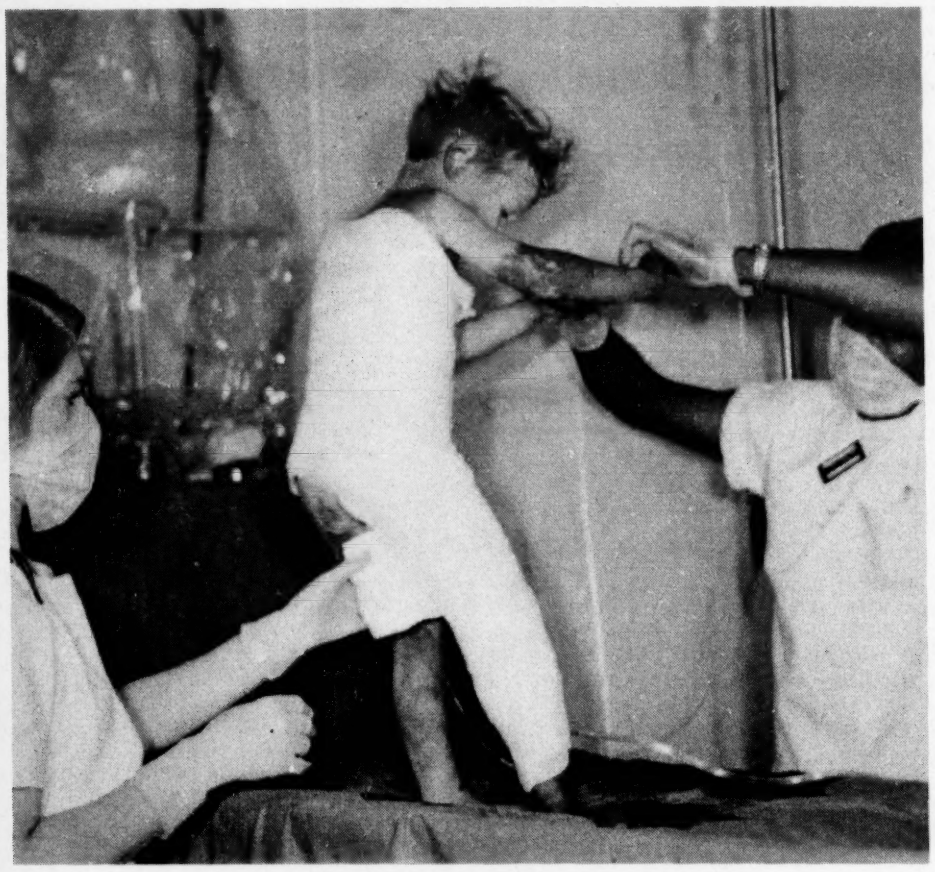
Most of the damage was done to his legs, although his arms, trunk, face, scalp, neck, and genitals are burned too. He does not go to the tank; he is bandaged in bed by a team of three nurses, who start with his legs. The dressings unroll, and already he is rising off the bed as best he can, teeth bared, staring at the nurses. He growls and grunts. Luke's legs are shredded and bloody, the feet a shiny black, the shins showing bare bones. As his thighs are washed, he lifts, trembling, off the bed as though an electric shock is running through him, back arched and lips drawn back in a grimace.

Pain is the sacrament of burn care, the expectation, essential, unavoidable. Patients are given narcotics in the half-hour before dressing changes, but they serve only to dull — to dissociate the pain. Combine the drugs, the routine, and the many procedures with the intense pain, and an aura of unreality is created; the patients float, dreaming, losing track of time and day and place. As you stand by the bed or tub you want to stop this pain. You want to do whatever can be done to take it away — give more drugs, stronger drugs, smother the cries with a nearby pillow, knock the moaning child out just so she'll stop. Your helplessness is palpable. Your job is to cause more pain.

One researcher describes it as a "kaleidoscopic experience, a series of discrete, severely painful procedures punctuating the day and night." It has a quality beyond ordinary pain, beyond the ache of a fractured leg or a fresh surgical wound; I think this is so because it carries with it mutilation and mutation, the demand for a new face, a new life. A person is literally unraveled by the pain, rent open, peeled. Burn pain is a leap beyond: "In the realm of suffering, affliction is something apart, specific, and irreducible. It is

quite a different thing from simple suffering." When Simone Weil wrote these words, she meant to show the reader a road to God. She is not the first to find in physical pain and psychic suffering a trial and a purpose. To Elaine Scarry, it is "the making and unmaking of the world." Aristotle cautioned us that the wise person looks not for pleasure, but merely for freedom from pain. This is all the burned person begs for; if he begs for God, it is only for His intervention. For a life in which he needn't beg for God in pain.

Manual of Burns



Burn wounds are wrapped with 36 layers of gauze kept continuously moist with silver nitrate solution.

To stand by a bedside and pull the bandages off the wounds, however gently, is to participate in this affliction. But the bandages must be changed. How odd, then, that people who spend their professional lives in burn care cannot agree about the nature — or even the strength — of this pain.

When C. S. Lewis lost his wife to cancer, he exhorted a God he was no longer sure he believed in: "Already, month by month and week by week you broke her body on the wheel whilst she still wore it. Is it not yet enough?"

There is a long-standing argument among the researchers. Although all agree that the pain can be excruciating, disagreement remains on how constant and how disrupting the pain is to the patient. To be the perpetuator of frequent intense pain appeals to few of us, and I suspect the elaborate efforts of some writers to downplay the problem represents a desire to be free of it, to atone for it. The textbooks themselves devote precious little space to pain: a 1982 burn-care text of over 550 pages discusses pain for less than 4 pages, in scattered paragraphs. A study of nurses' attitudes toward burn pain concluded that over half delayed giving narcotics in order to reduce the chance of addiction. Another study, in which both nurses and patients were interviewed, found that the patients claim their pain is worse and their medication less effective than nurses believe it to be.

The writers are particularly careful to remind their peers that what *looks* like pain may in fact be simply anxiety, fear, or depression and that we mustn't be too easily manipulated by the patient. How embarrassing for a physician to discover that her young charge afflicted with third-degree burns of the legs and genitals was merely pulling the wool over her eyes, that he was not really hurting that much, that he could have survived another hour or four without his morphine! Such deception makes a fool out of the doctor and nurse, who have been unnecessarily generous with their goods. After all, anxiety, fear, depression — all these conditions can be treated separately, charted differently, discussed apart. The pain must not be given weight merely because the patient claims it exists, because the patient is under the mistaken impression that he or she may be pain-free, and such is not the case. The search is on for a scientific measurement of pain in order to make it objectively real.

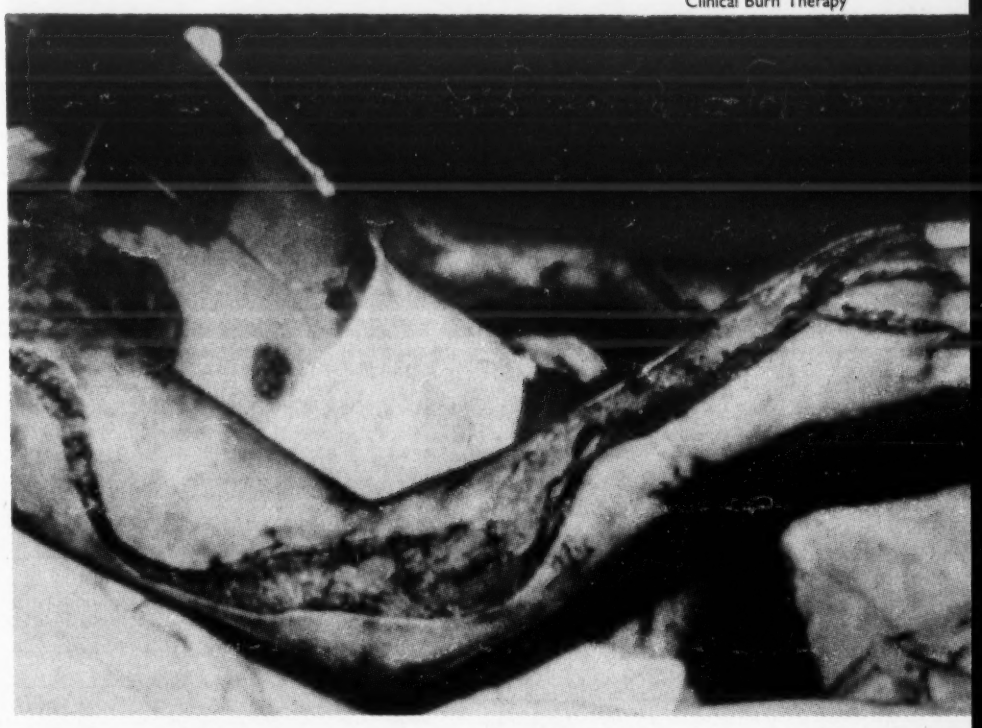
Research is done to prove that pain hurts because so little can be done to relieve it. It is not just a matter of giving more narcotics. Too many narcotics can depress the respiratory system, leading to shallow, ineffective breath, a problem that becomes very serious for a person with smoke-inhalation damage. Narcotics add to the dreamy, otherworldly quality of the unit and can make fear and anxiety worse by taking away a sense of control. And fear and anxiety *do* increase pain, without a doubt, so their presence is relevant. The desire for an objective measurement and a source of blame stems not just from guilt, but from impotence.

In this light, the casual attitude of the staff takes on a tender side. Dressing changes and tubbings are often accompanied not only by nurturing words and calm explanations, but by conversation between staff about family and personal problems, sports, recipes, troubles with the supervisor or schedule, diets, and the latest group of medical students. Without this detachment, the pain strikes you in the face like a haymaker, like an unexpected splash of cold water. That visceral urge to be rid of it — *to make it go away* — would win out. To stay on the job you have to

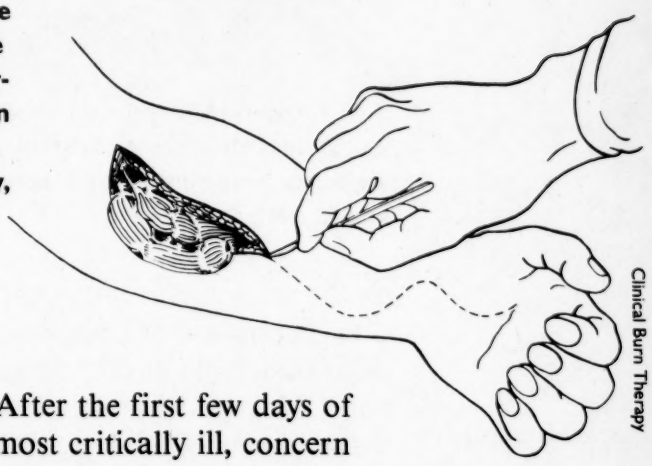
be able to hold up the trembling leg, hold down the struggling child, and think of other things.

Animals can be made crazy by unpredictable, uncontrollable pain. Researchers call it "experimental neurosis." The concept is well-known to professional torturers. It is not the intensity of the pain alone that breaks a person down — it is not knowing when it will occur, having no way to anticipate, prepare for or control it, not being able to associate the pain with anything you have done to deserve it. It shatters the defenses.

Learned helplessness is a kind of experimental neurosis in which the person quits fighting and withdraws. It is characterized by "agitation followed by lethargy and depression, feeding disturbances, decreased ability to learn new associations between responses and outcomes, and chronic anxiety. Burn victims are . . . eventually unable to distinguish painful from non-painful events." In a very real sense, this is only a logical extension of surrender, the rendering up of the identity to the demands of the caregivers. Sick people are allowed to deviate, exempt themselves from responsibility, put themselves in the hands of others.



Severely burned flesh is purposely sliced by the surgeon to release the stress and improve circulation of fire-swollen tissue. This incision is called an escharotomy, and is cut in a lazy-S pattern on limbs.



Clinical Burn Therapy

A "successful adjustment" to the role, though, carries the requirement that the sick person acknowledge that to be sick is bad. Being sick, you must work to overcome it, cooperate with the authorities, agree to return to health if possible. Too much withdrawal, too much surrender, becomes a negative thing — maladjustment. Many burned children begin to withdraw and become passive within a few days of the injury, lapsing into a kind of flaccid unconsciousness when the "painful events" begin. The organism has an instinct for survival, to preserve the fighting energy for a later time, when it may make a difference. The lack of control is everything. Burned children are like rats in cages with electrically impregnated floors who, once they discover that there is no escape when the shocks begin, lie still and quiescent until the shocks are over. Such rats eventually make no attempt to leave even when an exit is offered, but stare at the open door as though it were beyond understanding. No wonder, then, that badly burned children have long-term, sometimes lifelong, psychological troubles.

Scars are not inert, inanimate material. They are alive but dormant, and they can continue to grow and change for years. The healing of a burn wound is complex, a dance of skin cells and connective tissue that varies with every individual. People have a level of "burn resistance" which is thought to have a genetic base and which helps determine how their wounds heal. After the first few days of care, in all but the most critically ill, concern with scars becomes second only to pain — and eventually surpasses it.

Grafted areas almost always appear better than a similar wound allowed to heal by itself. But grafted areas tend to perspire less, produce less oil, itch, and have scattered and sparse hair growth. The new skin, grafted or not, can't be exposed to sunlight for over a year, and for many months it is sensitive to friction and temperature changes, bubbling up with blisters from even a small irritation.

Most grafts are the paper-thin, split-thickness type. Full-thickness grafts, used most often on the face, hands, feet, and joints, have another oddity: if taken from an area of the body with more fat deposits, such as the outer thigh or abdomen, the graft can gain weight in its new home as though it had never moved, grow thick and soft and flaccid.

Burned skin changes color. The melanocytes, cells in skin that determine both original color and how much a person will tan, behave erratically and unpredictably as a burn heals. A dark person becomes lighter in spots, a lighter person gets patched with dark areas. Makeup is little help. A black nurse who works with burn patients says, "There are no products

Burns: A Team Approach

Scar formation is reduced by wearing body garments and splints that place constant pressure on the healing burn. Sometimes, to shape feet, stiff boots are added over them.

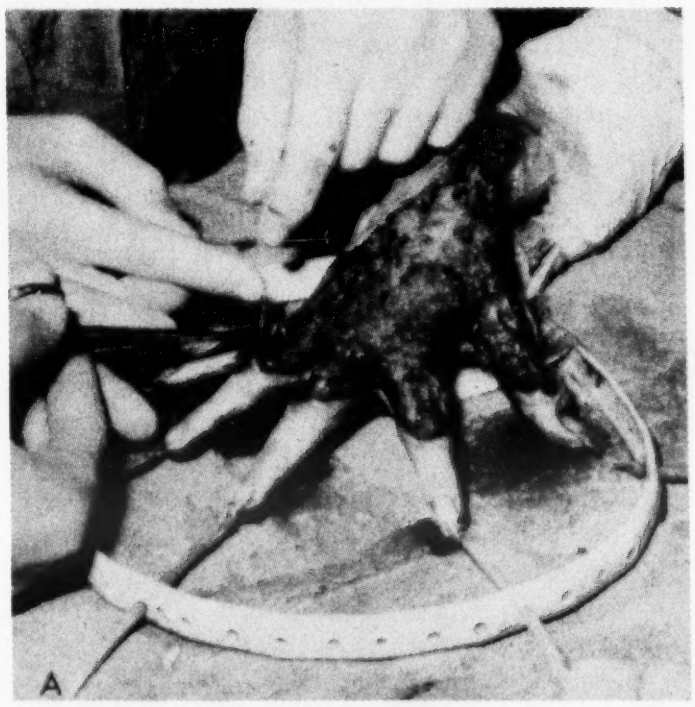
on the market currently that will work for black skin. People are as disappointed with theatrical paint that looks theatrical as with the burn itself." Makeup of any kind irritates the highly sensitive new skin, clogs already dry pores, and causes rashes and blisters. Surgeons, if they have the leeway, try to match skin color in a graft, but often there isn't enough skin to worry about such niceties. Some surgeons have even attempted to tattoo grafts to improve the color.

Certain scars have a life and purpose all their own. These are the keloid and hypertrophic scars, fungating and florid tissue that spreads across the line of injury over healthy skin, massive and hard and in high-ribbed ridges. They are particularly attracted to the face, and blacks are at the highest risk. A young man in the clinic has a back covered with them, running across him like smooth, cooled lava or a groundcover of mushrooms all melded together. They have a life of their own, apart from the skin around them, from one's wishes, one's dreams. The young man watches me watch him, his eyes brimming, ashamed.

These scars also have a great many — too many — blood vessels, so that they are bright red in color. They can grow and change for many years. This rank and vegetal growth mocks a person long after the wounds are healed, after he or she is pronounced well, even dictating clothing.

A badly burned person wears a new sheath of skin, for life. The skin is like an unwelcome garment, like wool underwear in July. But on top of this goes more: they are called pressure garments. They fit particular areas — hands, legs, chests. Worn 24 hours a day, winter and summer, they are hot. They are restrictive. Over time they will compress hard, rigid scars to a softer, less ostentatious shape. They are a flag, a sign, another idiosyncrasy of the burned. The pressure garments can help with all but the face. Badly scarred faces are in a category of their own.

"Without their faces, human beings could hardly be human at all," writes Norman Bernstein, a psychiatrist and the author of a book devoted to the emotional problem of people with disfigured faces. All our ideals of beauty and ugliness begin with the face. Our ideal of the soul, of the mirror each person can hold for another, of expression and duplicity and the recognition of common experience, begins in the face. People who have lost their faces are not handicapped. They are eunuchs. Others cannot bear to look upon them; if they could, they would be met by a stiff, mummified bed of scars that cannot show emotion. They die a social death, if not a physical one.



Burns: A Team Approach

Fingers are difficult to graft, because of their shape and the need to keep mobile. Tiny fingers pose the additional problem of growing bones, which push against slowly healing grafts. Between fingers and toes grow blankets of tight red skin that weld joints together, despite the most diligent care.

Another method is traction and forced positioning. Tiny pins are drilled into or glued onto the fingernails and the hand hung by these pins from a rack. Pins can be inserted in ankles, wrists, even chins to hold a joint in a certain position. The devices used to string up a joint have been named banjos, hayrakes, and halos for their shapes. To keep a chin and chest from welding together, a person with neck burns may lie with head hyperextended for weeks, looking at the juncture of wall and ceiling. After traction come the splints, worn all day and night and removed only for range-of-motion exercises.

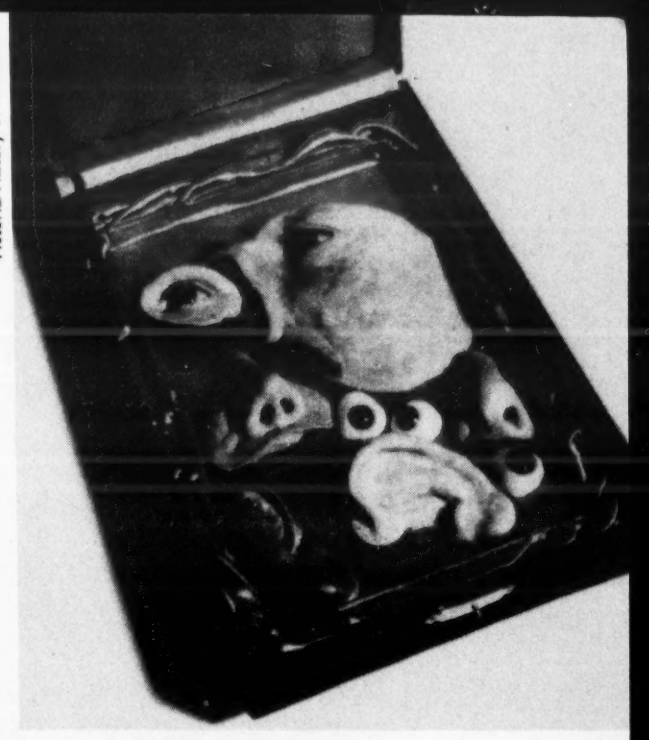
Said Dante in Hell:

> *And I, when he stretched out his arm to me/Searched his baked features closely, till at last/I traced his image from my memory /In spite of the burnt crust.*

The neurologist Oliver Sacks, speaking of the similar fate of the Parkinson's disease patient, calls it "ontological outrage."

Masks, not pressure garments, are made to treat facial scars. Technicians who specialize in the work make molds of the person's scarred face and then whittle down the result to an approximation of its former self. A mask is cut from the mold and fitted with straps, and holes are cut for the eyes, nose, and mouth. The masks are either transparent or opaque, as the person wishes; some appreciate the transparency and feel less isolated; others welcome the opaque curtain that hides their mutilation from others. Like the stockings, the masks are worn all day and night for nine months to a year. I almost want to go have a cast thrown for myself, just in case, to ensure the best resemblance if the need arises.

The possibilities are astounding. Synthetic ears and noses, built-up chins and fleshed-out cheeks, transplanted eyebrows and grafted lids all form in the hands of plastic surgeons and their lab technicians. If an eye has been destroyed, an artificial one can be fitted into a reconstructed socket. Lips that are burned badly enough to be excised in surgery can be regrown by a flap of the tongue; several years after such an operation, the tongue is usually mobile and appears normal, and the new lip is only mildly redder and bumpier than its predecessor. Mouths can also be reformed with "mouth-expanders," orthodontic appliances gone wild that stretch the lips wide and open. Textbooks show us before-and-after pictures, show first the monstrous gap, then the presumably contented model attempting to smile, a bit awkwardly, for the camera. Sometimes the pictures have black slashes across the eyes, as though they had been found in a raid on a pornography store. I find this especially odd: who would recognize these stricken countenances?



Pictorial History of Medicine

Facial prosthetics in antique display case. Artificial face parts are needed when sophisticated surgery is unable to create a reasonable likeness of nose, ear, or eye socket.

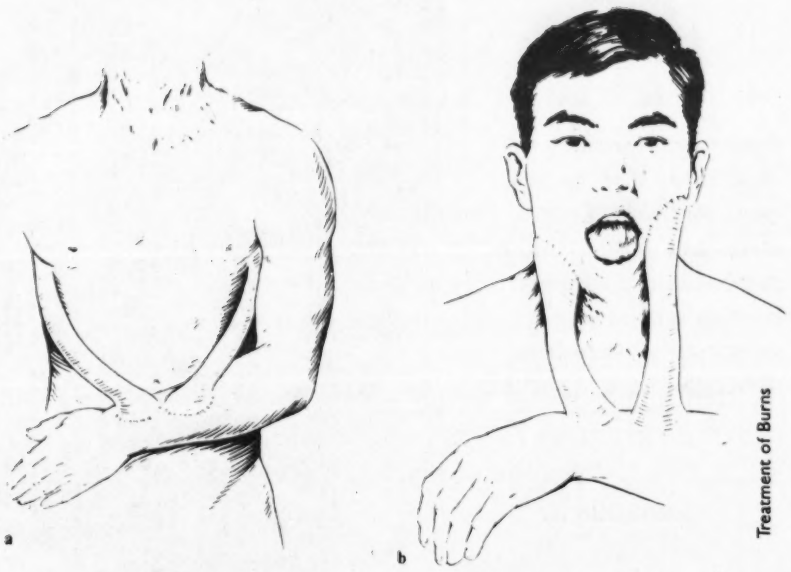
Dr. Sassall, we can't be touched around the eyes — what happens when the eyes are lost? The womb, the source, is violated and the self leaks out.

In his book, Norman Bernstein tells the story of Robert C., who was burned in a car accident at the age of 21. He was a hitchhiker, a soldier going home on leave, and when the car he was riding in crashed into a semi truck, he was thrown clear of the wreckage. He ran into the flames and pulled the driver out, a hero. The driver died, and Robert was deeply burned on the arms and face. He lost eight fingers, both ears, his nose, his eyelids, and almost all his facial skin and hair. Bernstein shows us a picture of Robert midway through his recovery. He is minimalist, taut. His eyes are too large, too wet, unframed by lids and lashes. The eye globes seem to bulge out of the white face. His nose is two holes, a little bloody. Why go on? Robert seems unfinished, cruelly so, as though God quit making him in a fit of pique. He is fetal without being smooth, rough, accidental. ▶

Manual of Burns

Mesh grafts, if they work, form scars exactly as though a window screen had been pressed firmly against the area — crocodile skin, a ridged pattern of diamonds.

A person may put his or her face on in the morning, after it has lain all night on the dresser. The ear and nose and even the eye can be attached to a thick pair of glasses, and it all goes on at once, with a tuck here and there. The prostheses become the person's real face, not a crutch, as much a part of him or her as the skin used to be. The results are unpredictable, but often surprisingly realistic from a distance; even pores and freckles can be created. It can be enough that a person will go to the grocery store, to the bank, for a walk, without too many heads turning, too many children pointing. But if we live somewhere in our bodies — if, like



Large, ambitious grafts have a better chance of taking when the borrowed skin is rooted to the working blood vessels in sound tissue. Tubes of skin are moved from the ribs to the arm, then attached to reconstruct the neck.

"Each person who looked at Robert had to make an effort to think of him as a human being. Some children have come up to him when he was sitting in a car and asked 'what he was' and how he came to look that way. While he was visiting a friend's house, a teenage girl walked into the room and saw him. She said what a horrible-looking mask he was wearing and tried to remove it." Robert lives with his parents, who care for him like a toddler because of his lost fingers. He rarely leaves the house, living on the insurance settlement that followed the accident. "As he spoke to me alone he began to talk about the hopelessness of his life and how people always turn to look at him. He said he could bear small children because they said what was on their mind, but adults were 'more sneaky,' and pretended not to see him, and then turned around and nudged each other." As, I fear, would I.

Robert can't wipe himself after he goes to the bathroom (he has no fingers), can't pull up his pants, button a shirt, or feed himself. An artificial hand has thus far been impractical because of the tenderness of the skin on his arms. "I think there is no good solution to his anxieties," ends Bernstein, sadly. Dante followed Virgil into hell and wept — and Virgil turned on him in contempt. "Still?" he demanded. "Still like the other fools? There is no place for pity here."

"With a child we would never quit. With an adult — maybe, only if there was no hope of survival, no chance," a burn specialist tells me, standing in the door of Jered's room, where he still lies unconscious on a ventilator. Jered's lungs have suddenly filled with fluid; his blood pressure is erratic. The doctor means never, no matter the prospects. Such is the nature of technology: it sets a standard, a constantly escalating standard that must be met. Once started, it is very hard to stop. No one wants to pull a plug alone, be the judge, take the risk. There is always the slight possibility that one is wrong, and even more of a possibility that someone will claim you are.

Much has been written about the zealousness of doctors, their secret and public motivation not to quit. I know I have a different morality from these doctors — and that they see me as the odd one out. But I don't think, in the end, that my motivation and theirs are all that polar. We want to see less suffering in the world — that is all. Where we part ways is just how much a kind of suffering death would be, to such a child as Jered, to countless other sick and dying people in hospitals around the country. Here we part as nurse and physician, as women and men, as more. It is a greater pain, to me, to watch the ventilator breathe than to wash the body. Is it to Jered?

Before surgery on this page, after surgery on the next. This man's face was deformed by a drastic chemical accident. Chemicals burn like fire, only their oxidation lacks flame.

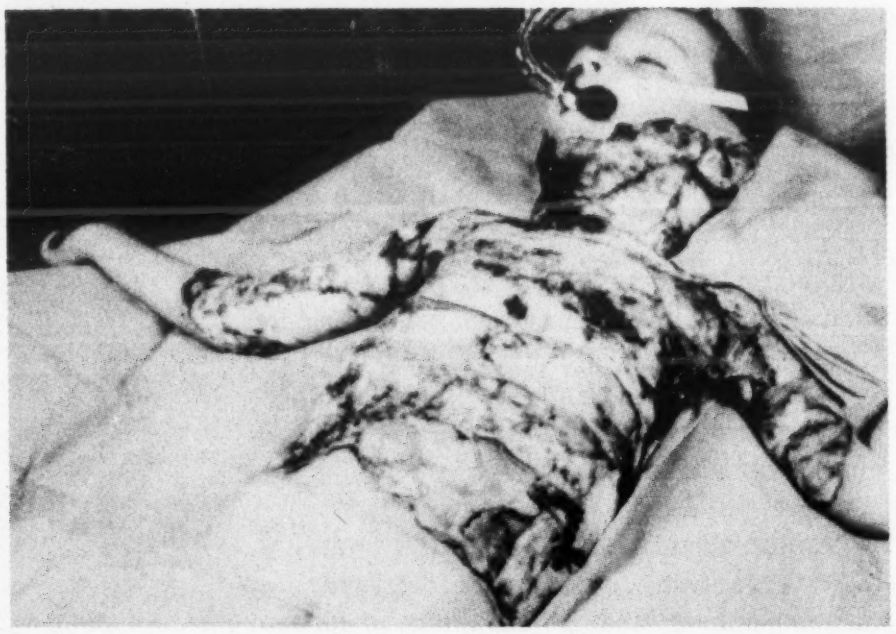
In 1977, a nurse and physician published an unusual article in the *New England Journal of Medicine.* The authors revealed that in their burn center they had gradually adopted a policy of "autonomy" for burn patients so badly injured that survival was unprecedented, either because of age or the degree of burn or both. In such cases, the entire burn team enters the patient's room while the physician explains the situation. "The presence of the burn team serves to witness and validate the patient's desires and requests, gives consensus to the gravity of the situation, and supports the physician member of the team in this delicate, painful task." While the patient is still lucid, the doctor explains that death must be expected whether or not treatment is intensely given. "At this point, those who interpret the diagnosis of a burn without precedent of survival as an indication to avoid heroic measures typically become quite peaceful." Of the adults admitted to this unit in the two years preceding the article, 24 were given this choice. Twenty-one chose to forego treatment. All 24 died.

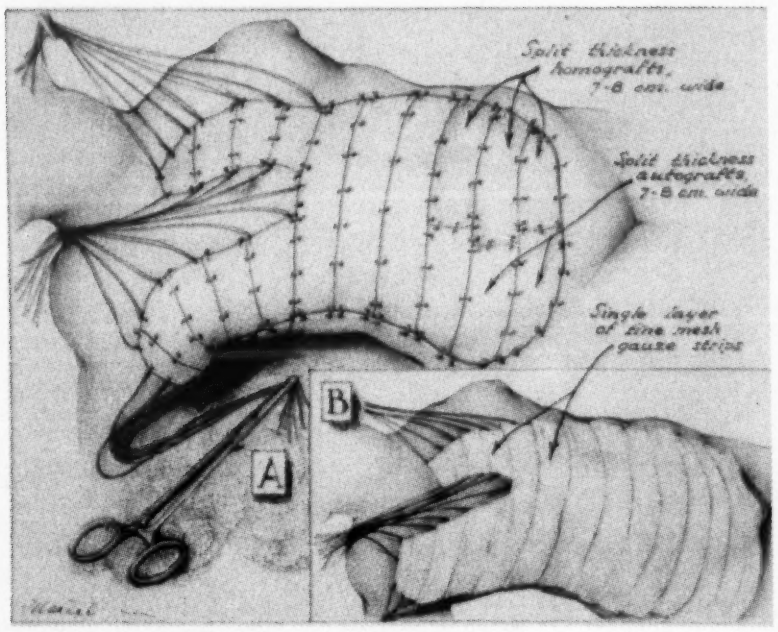
The hours that follow involve comfort care alone. Pain is controlled as much as possible, but complete sedation is avoided. No ventilators are used, so the patients can speak. No antibiotics, supplemental feedings, or surgery are begun, oxygen is given only to relieve discomfort, and dressings are changed as quickly as possible and only to maintain comfort. Mental health workers, such as a psychiatrist, are available, visiting hours are increased, and religious counselors are given access to the patient. By all reports, such patients generally remain cheerful before lapsing into a coma and dying. Since this article appeared, several other burn units have formally adopted what are called "comfort care protocols." One unit has a detailed, graphic method of deciding the treatment choices for people with burns of varying likelihood of survival. In this hospital, a person who has less than 5 percent chance of survival is offered comfort care alone; but people with 5 to 10 percent chance of survival and whose "specific injuries will drastically affect their quality of life" are also given the choice, as are people who made serious suicide attempts. In a strange twist on the controlling paternalism of medicine, a physician may even prohibit aggressive treatment against a family's or patient's wishes. "This grave risk is rarely taken," the article states, "and then only when compassion clearly demands it."

Comfort care, years later, is still a protocol at only a few burn units. A number of other units practice it, no doubt, in certain select and indisputable cases. Yet few, very few, want to go on record. The publication of that first article, in 1977, was an act of considerable courage on the part of the authors, however sensible and humane their explanation.

As long as the injury is so dreadful that no one is known to have lived through such a thing, these choices are hard to argue against. But many patients who are likely to live also express a wish to die. I am told of a number of patients who, months after their discharge from the hospital, thanked the staff for refusing to let them die when they themselves begged for it. "They know the difference between pain and despair," says one nurse, and I fear she is being a bit glib. Perhaps, lying there, we would all at first want death and then change our minds. Not everyone who survives expresses gratitude. Many spend the rest of their lives trying to find a reason for it. Uncertainty is the birth child of technology, which throws shades of gray in a mechanistic world. This is not unlike the neonatal intensive care unit and its riddles. If not us, who? ►

Through the use of "pedicle tube" skin grafting as diagrammed on the previous page, this patient's face was repaired with a total reconstruction of his nose. Done in China, which is famously skilled in burn surgery.





Dog skin is grafted temporarily over full-thickness burns as an immediate first aid. Three days later, these patches will be removed and superceded by grafts from the patient's own body.

If there is a best in this world of woe, it is best to be burned very young, to grow up with your scars, and consider them — as much as possible — a part of yourself. It is best to be burned in places like the back, the thighs, parts of our anatomy rarely exposed. It is worst, always, to be burned on the face and the hands, or to be burned as a teenager or young adult. For all a child can cry in homesickness, burn pain passes a limit; it violates a child's innocence. Children expect the world to be hard. But this is more than hard. Adults have sinned, if you will. They know about consequences, secrets, and disenchantment. They know, in convoluted ways, without surprise, that pain will come, that there will be suffering. Adults can sense a past without pain and a future without pain, however dimly, in the midst of pain. Children can do none of this; they rise from their beds with the most exhausted and bewildered expressions: Why? And you, there, you and you, why do you do this to me? Why won't you stop?

To survive, one must find the name of what has happened, make attribution, lay blame. Some blame God; others turn to God for solace. Some blame themselves, fate, family, kismet. Nancy blames luck — the bad luck that took her job, took away her insurance, gave her bronchitis, made her take medicine the night her house burned down. Her face is healed over now, although her arms are not, and her face is flushed red and swollen still as the thin scars settle in. With time, she will look well enough. The nurse tells me Nancy is depressed, asks for medication in the morning so she can sleep all day. The nurse is impatient with Nancy. "She's 30 going on 12," she chides.

For others, a bad burn can cleanse, freshen, direct. The flames clear the fallow field for new growth, strike away the weeds that shadow the young tree. This may be what happened to Luke, who set himself on fire several weeks ago.

He is alert now. His right leg was amputated below the knee, and he lost a toe on the left foot. His stumps will be long in healing because they required grafting, and an artificial leg must wait. "Luke has a positive and constructive attitude toward the future. It's almost as if he is looking forward to the weeks and months ahead. Of course, he barely comprehends what is ahead of him," writes the nurse in charge of Luke's care. "In our observations we see Luke as having experienced a phase where he had 'nothing to live for' — no goals and objectives set for himself. Now that he has survived his injury he has goals and tasks he wants to achieve. His new physical state has forced goals upon him which he has accepted. Now we see a very motivated young man."

"I am sending a thank you to all of you in the Burn Unit for the special care and love you gave." "How could we possibly express our feelings and gratitude to all of you sufficiently?" "Not a night goes by that I don't think of all of you hard at work." "Thanks for taking good care of my baby." These are excerpts from letters written by former patients and their families to the staff of one burn unit.

Little Michael went home with his father today, just a month after the fire. His is an unusual recovery, rapid and uncomplicated. It's far from over, of course: he will wear pressure garments on his chest and hands for another 18 months, and stockings or a mask on his face.

Zero mistakes. Jered is still alive. His burn wounds are almost healed, but he remains in critical condition and he is still on the ventilator. "His lungs are like those of a 60-year-old man with chronic lung disease," says the head nurse. The smoke inhalation, the high oxygen, the ventilator pressure have all caused permanent damage. To wean him off the machine will require "accepting lower oxygen levels" in his blood than one wants a child to have. We are in the neonatal unit once again, and no one wants to stop. Jered has been saved from certain death only to be consigned to an uncertain life, a respirator baby. His bill is past six figures, and who will pay? For that matter, what are we afraid of? He opens his eyes when you call his name; he winces with pain. These are the positive signs. No one has investigated the damage to his brain; no EEG yet. I wonder why. Would it only add another shade of gray?

How can we comprehend what lies ahead? Children can be so cruel; adults in their cowardice can be even more so. Bernstein tells a little story in passing:

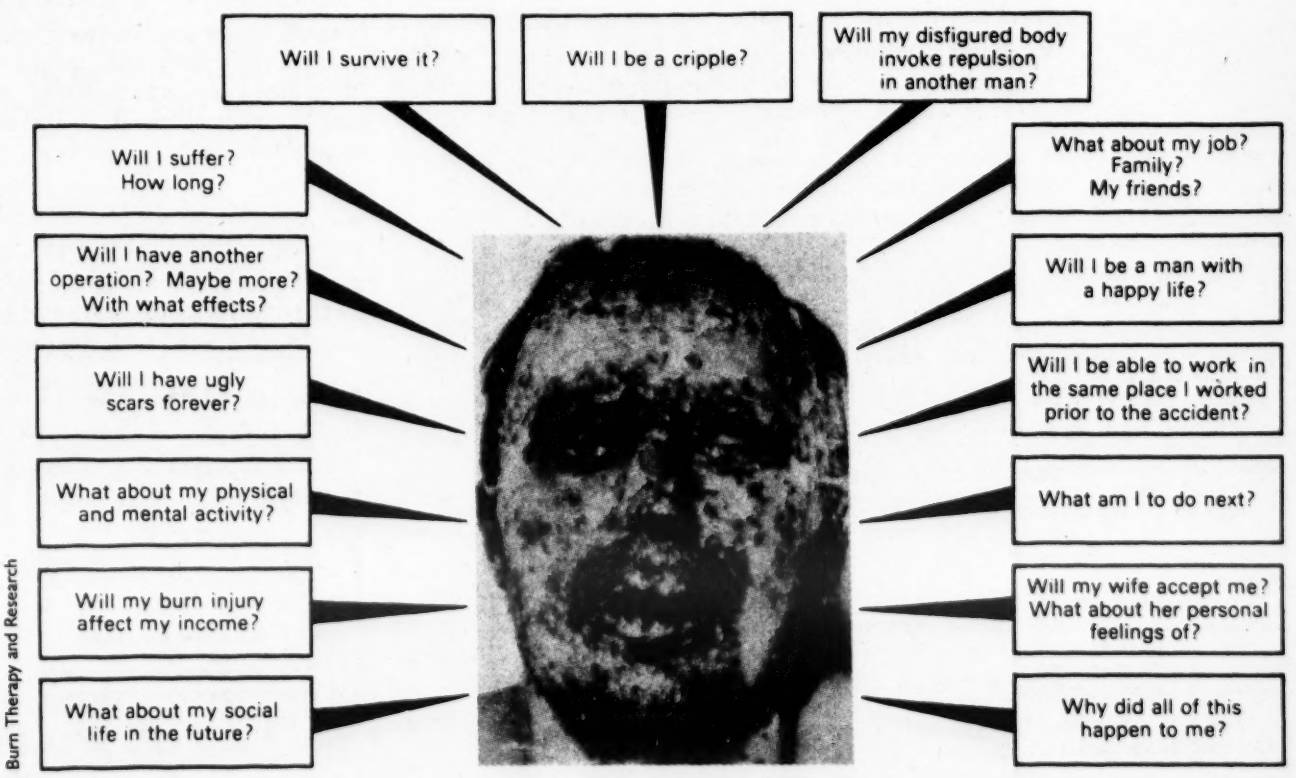
"James was a 14-year-old who had sustained facial and neck burns in a house fire. He returned to school, where he had always been a marginal student. When he was called on in class and failed to answer a question, the teacher asked, 'What's the matter? Did they also burn your brains out?' "

The world has always had the occasional freak, the Elephant Man and rubber-faced woman, the extraordinarily tall and immensely fat, and these people have held some kind of oddly privileged status in history. Appearing singly, without explanation, they pique our pity and curiosity without any true threat. They are modern Minotaurs, symbols of good and evil, reduced to mortal status and stripped of mystical powers. Like Janelle's more rudely made cousins, freaks satisfy our anthropomorphism, help us draw the circle tighter, define the boundaries. We haven't learned tolerance from mutation, only a kind of self-centered gratitude.

Such can never be the case for the burned, because they are our creation. I have to think, tritely, of the banishments and persecution that lepers suffered because they had a deformity that could be caught, a contamination. Like leprosy, burns are a contamination, a contagion — an extremity that could strike us all. We turn away from a man in his thirties, both legs missing, as he wheels down the street because, however unconsciously, we fear he is a war veteran — a product. No simple genetic mystery here. So we turn from the burned with a quiver of the stomach, fearing for ourselves — our own special creation.

Burned people only want their lives back. They want to live next door to us, shop at our stores, attend our schools, marry us. Are we asking too much of them, to make them try? Are we asking too much of ourselves? The subconscious terror fades so slowly. We gladly, gleefully, invite them to return from the dead (no, we insist), and then, holding the power of excommunication in the palms of our hands, we send them out alone. Perhaps those who not only survive in some contentment but thrive after a major burn are pilgrims in the wilderness, seeking the deeper meanings. Perhaps they are hallowed in some way by the shock of those around them, as though by a rarefied, ice-cold wind that etches away the rough edges.

It is a new world they have passed into: "I am fire and air; my other elements I give to baser life." ■

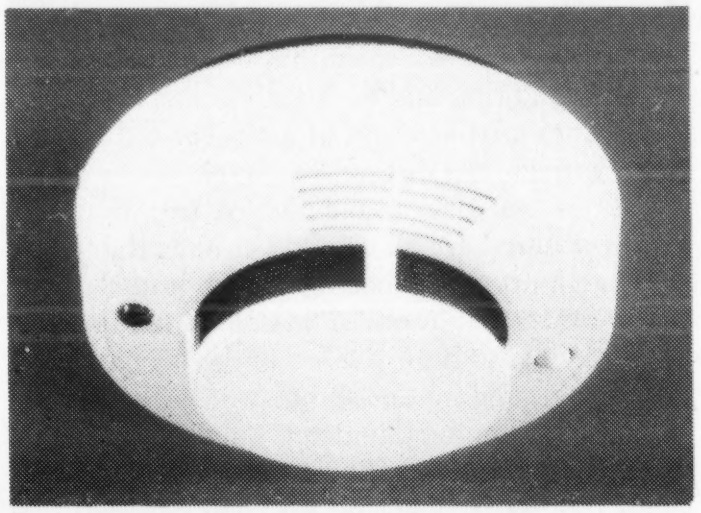


The psychological injuries of a burn patient.

A large burn won't necessarily destroy a healthy, well-adjusted person, but a small burn can seriously disrupt a person with other problems.

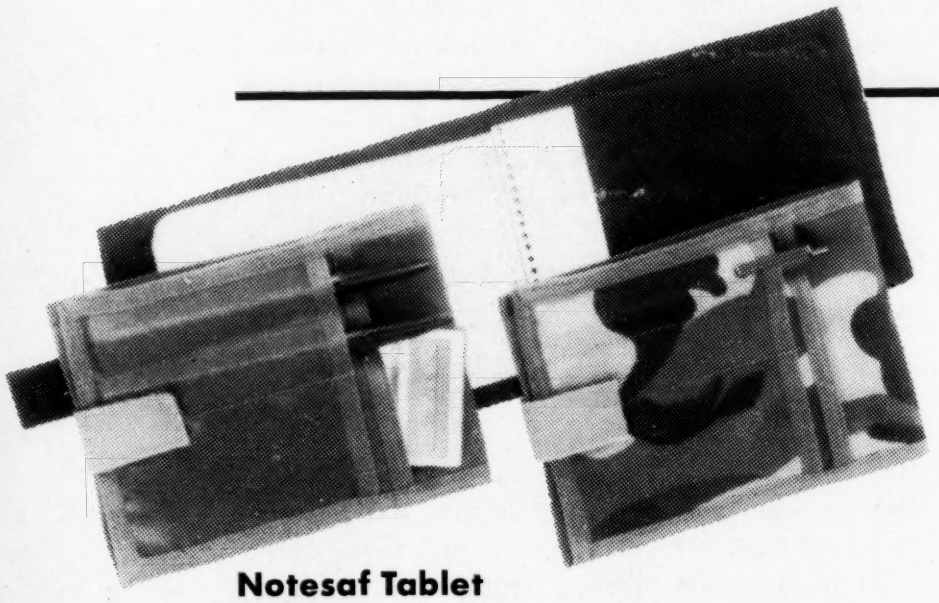
Sears Early One Smoke Detector

According to ***Consumer Reports****, this is the best buy in smoke alarms. It combines two types of sensors, a photoelectric and an ionizer, which provided the quickest response to fire out of the 24 models they tested. The alarms work on a small 9-volt battery that lasts a year; it beeps when the battery gets low. They recommend installing several.* —*Kevin Kelly*



Sears Early One Smoke Detector
$42 (list price)
$30 (mail order) from:

Local Sears Catalog Merchandise Distribution Center



Notesaf Tablet Holder
(with tablet)
$7.95
(additional tablets $1.49)

Fisher Space Pen
$8.95

from:
Brigade Quartermaster

Catalog **$2.50** from:
Brigade Quartermaster
266 Roswell Street
Marietta, GA 30060

Brigade Quartermaster pouches and notebook

I would hate to know the number of ideas, opportunities, phone numbers that I have missed for lack of an on-board pen and paper. I can't count on shirt pockets, so standard nerd-pak won't do, and that leaves nothing except the much-overlooked left rear pocket in male garb, which murders anything fragile. So those lovable mercenaries at Brigade Quartermaster came up with nonfragile implements and carrier — the Notesaf Tablet Holder, of nylon packcloth, black, green, or camo, which stays robustly on duty in rear pocket. If your life is unbearably intrepid you can get a Stormsaf notebook ($3.95) to go in there which enjoys being written on during rain, snow, and heavy dew, but I settled for perfectly ordinary tablets (4'' x 6'', $1.49) from Brigade. I did, however, get their Fisher shorty Space Pen ($8.95), which buries nicely in a pocket on the Notesaf Holder and has resisted all punishment and stayed with me longer than any pen in my life. I now write upside down frequently (lying down usually, when the profoundest of thoughts occur) and can hardly wait for zero-gravity. —*Stewart Brand*

People of the Lie

This book forces you to deal with a complex issue — human evil — and it doesn't give any easy answers. Peck suggests that evil is laziness carried to an extreme, or more accurately, that evil people resist growth, which is why we have a natural revulsion to them. He feels that evil people are aware of their own deficiencies and that they attack good people as a means to cover up. He also thinks that evil is oddly ineffective as a social force since it tends to serve as a beacon to warn people away.

Yet, according to Peck, evil people continue to behave in this self-defeating way because they aren't dedicated to reality, which is why he calls them People of the Lie.

This book will be at odds with almost any belief system you have — whether you're a skeptic, atheist, believer, or agnostic. It may cause you pain, outrage, embarrassment. Its truth has potential for abuse; it's a dangerous and challenging book. —*David Hawkins*

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The issue of naming is a theme of this work. It has already been touched on in diverse instances: science has failed to name evil as a subject for its scrutiny; the name of evil does not occur in the psychiatric lexicon; we have been reluctant to label specific individuals with the name of evil; in their presence, therefore, we may experience a *nameless* dread or revulsion; yet the naming of evil is not without danger.

To name something correctly gives us a certain amount of power over it.

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I have spent a good deal of time working in prisons with designated criminals. Almost never have I experienced them as evil people. Obviously they are destructive, and usually repetitively so. But there is a kind of randomness to their destructiveness. Moreover, although to the authorities they generally deny responsibility for their evil deeds, there is still a quality of openness to their wickedness. They themselves are quick to point this out, claiming that they have been caught precisely because they are the ''honest criminals.'' The truly evil, they will tell you, always reside outside of jail. Clearly these proclamations are self-justifying. They are also, I believe, accurate.

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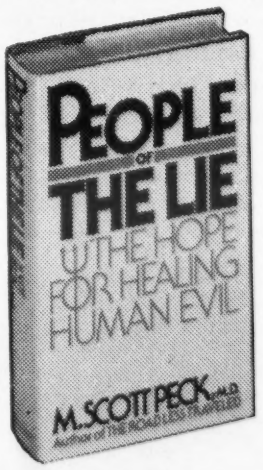
It is a thesis of this book that evil can be defined as a specific form of mental illness and should be subject to at least the same intensity of scientific investigation that we would devote to some other major psychiatric disease.

People of the Lie
M. Scott Peck
1983; 269 pp.
$7.95
($9.45 postpaid) from:
Touchstone Books
Simon & Schuster
Attn.: Mail Order
1230 Avenue of the Americas
New York, NY 10020
or Whole Earth Access



Making Love During Pregnancy

Making Love During Pregnancy *covers a subject that is mentioned only in passing in most books on pregnancy or sexuality. It will be helpful to any expectant mother and her lover in confronting their fears, both realistic and unfounded.*

Since many doctors offer no advice (or wrong advice) to those few bold enough to seek it, this book should be particularly useful. Sexuality after pregnancy is also dealt with.
—Walt Noiseux

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The rumor that orgasm may deprive the fetus of oxygen is based on the observable fact that there is a slight change in the fetal heart rate during orgasms. This is so small a change, however, that most scienfitic investigators have maintained that it has no adverse affect on the fetus.

Vaginal infections are nothing to be more afraid of in pregnancy than at other times. The fetus is safely protected from any "dirt" that might be introduced into the vagina. He is inside an unbroken sac of fluid and that sac is safely protected within the uterus which is sealed off from the vagina by the cervix. One can't help but wonder what was meant by "dirt"; if there is a question of the man's hygiene, it should be dealt with whether his wife is pregnant or not.

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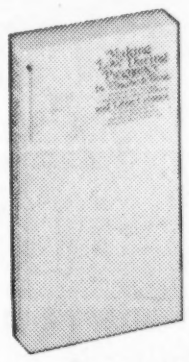
"As far as sexual desire during pregnancy goes, I'd say that the first three months was normal. (We have been together for eight years and we have sex on the average of three times a week, but often going through phases of more or less.) Because my body didn't look pregnant I didn't really feel pregnant. (I had no morning sickness or problems.)"

Making Love During Pregnancy
Elisabeth Bing
and Libby Colman
1982; 165 pp.
$2.95
($4.20 postpaid) from:
Bantam Books
414 East Golf Road
Des Plaines, IL 60016
or Whole Earth Access



Safe Natural Remedies for Discomforts of Pregnancy

The experts at Planetree Health Resource Center say that this cheap, concise booklet dispenses big-book advice on how to get rid of the hurts of pregnancy without hurting your baby with pills. *—Kevin Kelly*

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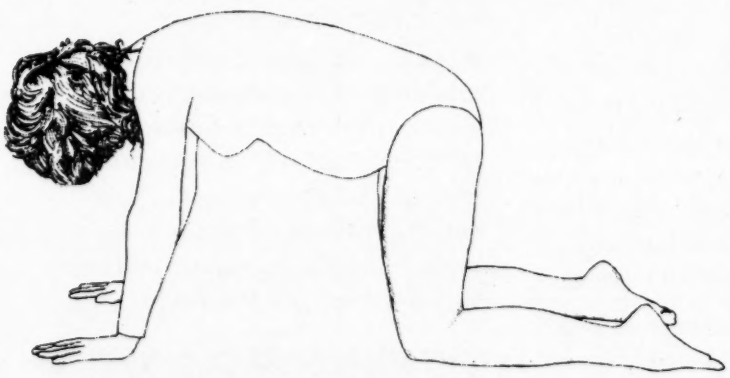
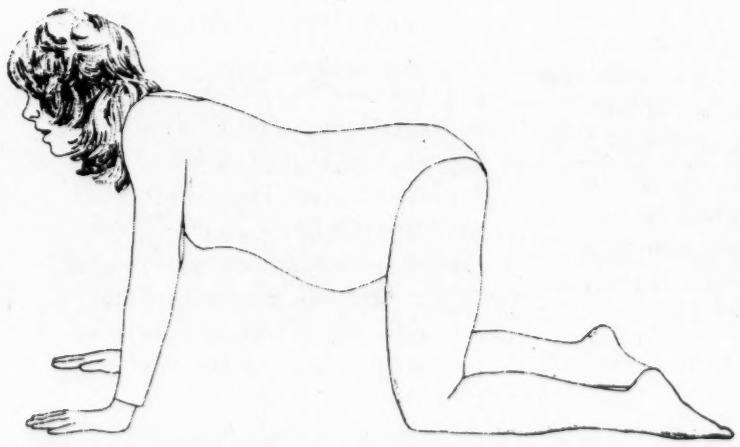
We do not know of any painkillers that are 100% safe. Many doctors believe that during pregnancy acetaminophen (brand names: Tylenol or Datril) are safer than aspirin. For an occasional headache *(1—2 a month),* Tylenol or Datril *(1—2 tablets only)* will probably be safe.





Pelvic tilt for backaches:
The basic movement is to tuck your buttocks under, which flattens out the hollows at your lower back. Hold for 3 seconds. Relax, letting your hips move back to where they were. Repeat as many times as comfortable.

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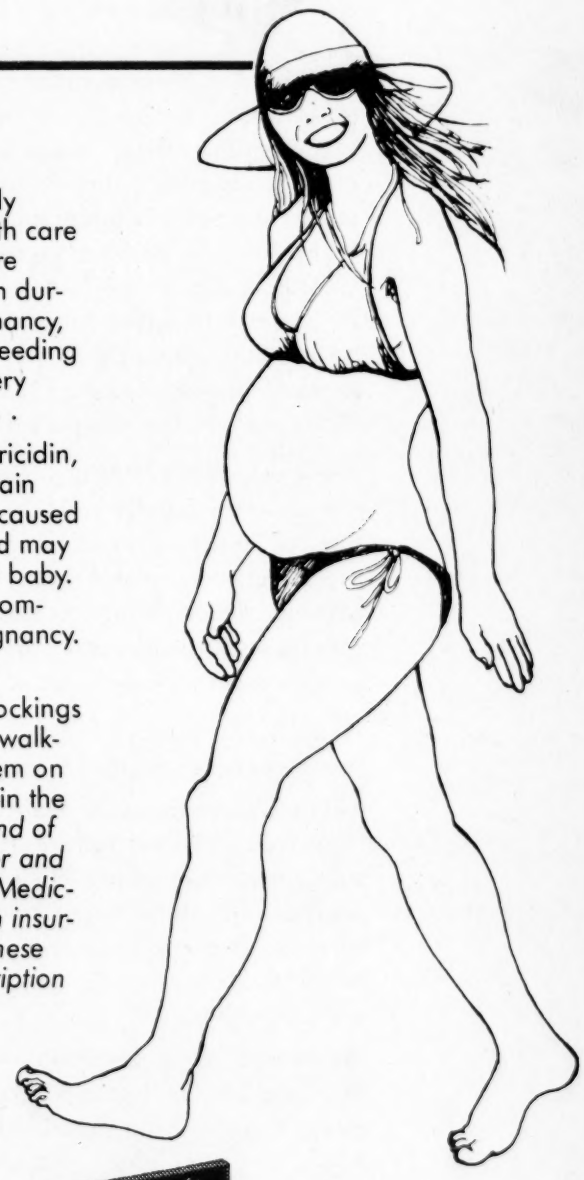
Medicines Not to Be Used
Aspirin should be taken only when prescribed by a health care provider who knows you are pregnant. If aspirin is taken during the last month of pregnancy, it may produce increased bleeding in the mother during delivery or in the newborn baby. . . .

Cold remedies (Contac, Coricidin, Allerest, Dristan, etc.) contain antihistamines, which have caused birth defects in animals and may be harmful to your unborn baby. Therefore, they are not recommended for use during pregnancy.

•

Wear full-length support stockings when you are standing or walking for a long time. Put them on before you get out of bed in the morning. *Note: the best kind of support stockings are Bauer and Black or Jobst. Medi-Cal (Medicaid) and some other health insurance policies will pay for these if you get a doctor's prescription for them.*



Safe Natural Remedies for Discomforts of Pregnancy
Coalition for the Medical Rights of Women
1981; 30 pp.
$2.25
($3 postpaid) from:
Coalition for the Medical Rights of Women
2845 24th Street
San Francisco, CA 94110
or Whole Earth Access

EDUCATION (AND DEGREES) BY MAIL (OR MODEM)

by John Bear, Ph.D

NO WONDER more than 25 million Americans have left a college degree program uncompleted. College is vastly more expensive than most people think. "Going off to college" takes you out of the job market (other than low-paying, part-time student jobs) for years. Not only does a typical bachelor's degree cost forty to fifty thousand dollars, you must also subtract another fifty or sixty thousand for the four years of salary that you didn't earn during this period.

A few years ago (*NWEC* p. 573), I discussed the rapidly growing trend toward "non-traditional" degree programs, or ways and means of earning bachelor's, master's, doctorates, and law degrees entirely, or almost entirely, by home study.

Happily, the number of programs just keeps on growing. For example:

• The University of the State of New York and other fully-accredited state universities offer bachelor's degrees that can be earned totally by correspondence at a cost that can be under $500.

• City University in Seattle is offering its M.B.A. electronically; you can complete the degree without ever getting up from your IBM, Apple, or Commodore computer, wherever in the world you live.

• The University of London and several other major international universities have Ph.D programs that can be completed entirely by correspondence study, plus an exam taken at the nearest embassy or consulate.

• Hundreds of people have passed various Bar Exams and entered the practice of law without ever setting foot in a law school; all their work was done at home by mail, telephone, or computer modem.

What makes it all possible is the still-controversial concept of credit for life experience learning. Proponents of this notion claim that if you know something, it doesn't matter how you learned it; you should get college credit for it. If you are fluent in German, they say, what difference does it make whether you learned it in college classes, from your grandmother, from Berlitz, or because you once lived in Germany? You deserve the same number of credits as if you had attended German classes at the state university for four years.

On the other hand, some people insist that meaningful learning can take place only in a college classroom. They allow that *some* credit could be given for off-campus learning, but to award an entire degree for work done at home or on the job somehow subverts the educational process (and cuts down on attendance at the football games).

Only three accredited schools will award degrees based entirely on things you did before you enrolled: the University of the State of New York, Edison State College in New Jersey, and Charter Oak College in Connecticut. But scores of other schools have programs that offer generous credit for prior learning, and then require as little as one semester of new work, either on campus or by correspondence, to earn a degree.

These are some of the best programs available.

Bachelor's Degrees

• University of the State of New York, Regents College, Cultural Education Center, Albany, NY 12230. No faculty. No campus. No courses. No library. No football team. Just universally accepted, accredited associate's and bachelor's degrees in almost any subject based on prior coursework, exams, correspondence courses, and/or assessment of nonschool learning experiences. 100 percent by correspondence.

• University of London, Senate House, Malet St., London WC1E 7HU, England. Nonresident degrees have been offered for over 140 years. For the bachelor's degree you enroll, wait three years, then take a day or two of exams at your nearest consulate. The university doesn't care what you do during those three years. You can take classes elsewhere, study privately, etc. As long as you can pass the exams (usually just in one field), you get the degree. They also have external master's degrees and doctorates, but you have to earn *their* bachelor's first.

• Thomas Edison State College, 101 W. State St., Trenton, NJ 08625. Almost the same model as New York, with the added option of completing most or all of the required work using your home computer.

• American Open University, 21 Chestnut St., Greenvale, NY 11548. Bachelor's degrees in business, behavioral science, and general studies totally by home study, including correspondence course modules, challenge exams, and credit for life experience learning.

Master's Degrees

• California State University, Dominguez Hills, 1000 E. Victoria St., Dominguez Hills, CA 90747. The External Degree Program in Humanities is a home study degree in history, philosophy, religion, music, or art. My wife just finished her master's degree here (she did give in and go to the campus once, out of curiosity).

The author earned his degree from Michigan State University in 1966. He is the author of the commendable Bear's Guide to Non-Traditional College Degrees, *$10.95 postpaid from Ten Speed Press, Box 7123, Berkeley, CA 94707. —KK*

• Empire State College of the State University of New York, 2 Union Ave., Saratoga Springs, NY 12866. The Center for Distance Learning has nonresident master's degrees in a variety of fields, all related to policy studies: business, labor, culture, etc.

• City University, 16661 Northup Way, Bellevue, WA 98008. The M.B.A. degree can be completed entirely over your home computer through the auspices of a clearinghouse called Electronic University. E.U., located in San Francisco (505 Beach St., San Francisco, CA 94133) intends to facilitate a wide range of accredited computerized degrees; this one is the first.

Doctorates

• Union Graduate School, P. O. Box 85315, Cincinnati, OH 45201. Union offers the opportunity to earn an accredited Ph.D in almost any field, almost entirely by independent study. Roughly 35 days of attendance at short seminars (held in various locations around the U.S.) are required. The main activity is production of a "project demonstrating excellence" — something showing that you are very good at what you do.

• University of South Africa, P. O. Box 392, Muckleneuk Ridge, 0001 Pretoria, South Africa. The largest correspondence university in the world offers students the opportunity to earn extremely inexpensive bachelor's/master's degrees and doctorates without having to visit that beleaguered land. Many people will avoid UNISA on political grounds. Others will note that it has more black students than any university in the world (including, in past years, Nelson Mandela, and Robert Mugabe of Zimbabwe, who earned his doctorate there.

• Nova University, 3301 College Ave., Fort Lauderdale, FL 33314. Master's degrees and doctorates in education, business, computer science and related areas can be earned through a combination of independent study and attendance at a series of weekend and one-week seminars, held in 30 or more locations around the world each summer, as well as through teleconferencing. The programs are designed for mid-career professionals, who can earn the degrees with minimal time away from their full-time jobs.

Four things to do before sending any money to any school

1. Check out the degree with any relevant gatekeepers. If a degree will help with job advancement, salary increments, state licensing, graduate school admission, etc., be certain in advance that the degree in question will meet that need. Don't rely on assurances from the schools.

2. Check out the school with the agency in its state that oversees higher education, and with the Better Business Bureau in its city.

3. If an accreditation claim is made, independently verify that it is correct, and that the accrediting agency is one recognized either by the U.S. Department of Education or the Council on Postsecondary Accreditation.
There are more than 100 accrediting agencies, including at least 20 unrecognized ones, set up by schools for the purpose of accrediting themselves.

4. Ask the school these questions: How many degrees in my field have you awarded in the last year? May I have the names and addresses of some recent graduates? May I examine work done by your students? Which faculty member(s) will supervise my work? What are their credentials? Are they full-time employees or is this a sideline for them?

If you have further questions, check the school out in *Bear's Guide to Non-Traditional College Degrees* (9th edition, Ten Speed Press, Berkeley, CA 94707, 1985, $9.95 plus $1 shipping and 6½ percent tax in California; $11.95 postpaid from Whole Earth Access).

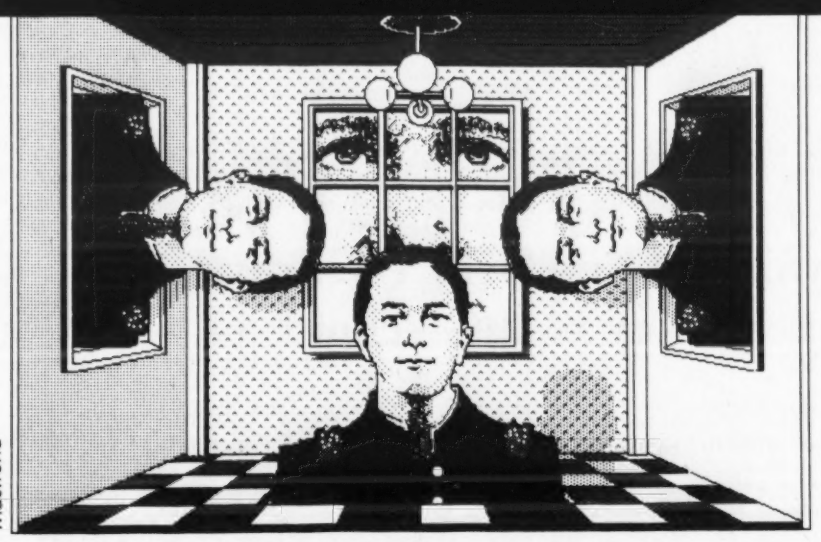
Law Degrees

California is the only state where Abe Lincoln could qualify for the Bar Exam using the "study-by-the-fire" method. You study at home for one year, take a "Baby Bar" exam to see if you're on track, study for three more years (864 hours a year), and then take the regular Bar. Only 10 percent of home-study students pass the first time (compared with 60 percent for traditional law schools), but that 10 percent wouldn't have it any other way. A current list of recognized correspondence schools is available from the State Bar of California, P. O. Box 7908, San Francisco, CA 94129.

Unaccredited Schools

More than 200 unaccredited universities offer nonresident degrees of all kinds. Some are serious endeavors whose degrees require substantial amounts of work and are widely (though not universally) accepted in the academic marketplace. Others are "one-room schoolhouses" that do little more than look at your resume and say, in effect, "Oh, that's wonderful. Hand over 2,000 bucks, and we'll award you our Ph.D." The FBI has been extremely active in recent years, exposing and closing down diploma mills through its "DipScam" operation, but the wheels of justice grind slowly, and dozens of fraudulent schools are still operating in the U.S. and Europe.

To get an idea of the kinds of degrees and programs offered by some of the better unaccredited schools, request the literature of California Coast University (700 N. Main St., Santa Ana, CA 92701); Columbia Pacific University (1415 Third St., San Rafael, CA 94901); International Institute for Advanced Studies (8000 Bonhomme Ave., Clayton, MO 63105); California University for Advanced Studies (100 Galli Dr., Novato, CA 94947); and Southwest University (4532 W. Napoleon, Metairie, LA 70001). ■



Macworld

Macworld • The MACazine • MacUser • MacBriefs

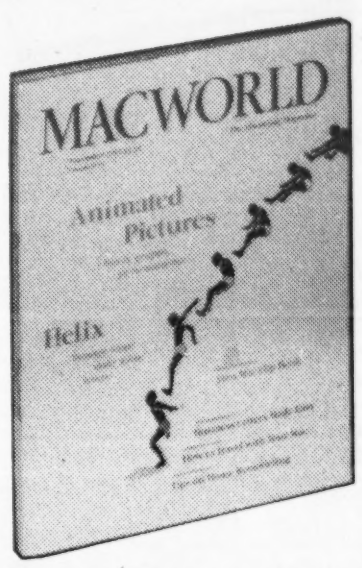
Though recent handwringing in the industry press has it that Macintosh sales have been rather flat of late, over a half-million of the things are now out there in use. This sizeable user-base has allowed a unique situation to arise where no less than four Mac-related magazines are jostling each other in their efforts to keep Mac-owners (and Mac-watchers) up to date on new software, peripherals, and user advice. If you own a Mac or are contemplating buying one, a subscription to at least one of these publications is in order.

Now entering its third year, ***Macworld*** *is the longest-running, fattest, and most authoritative of the four. Its early emphasis on exhaustive articles and reviews has been supplanted somewhat by more emphasis on human interest features and profiles, making this the magazine to get if you want to sit down and enjoy a good journalistic trek into the Mac universe.*

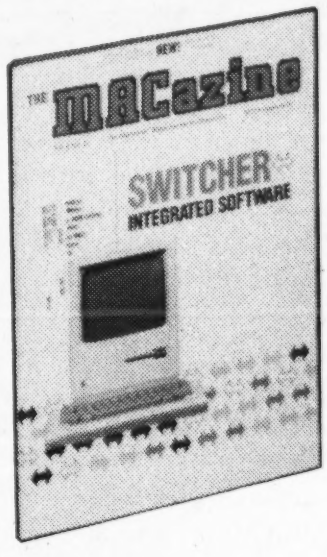
By way of contrast, ***The MACazine*** *has an amateur air about it even after more than a year of regular monthly publication. In many instances,* ***The MACazine*** *reviews and articles are more critical (thus more useful) than those in* ***Macworld****, due perhaps to the distance between Athens, Texas, where* ***The MACazine*** *is produced, and the rest of the industry. With much of the material written by non-professionals,* ***The MACazine*** *provides a good grass-roots feel for what's happening with the Macintosh.*

MacUser *is the spunkiest of the lot, a late arrival that has seemingly learned from the shortcomings of its rivals. Initially edited by Compuserve Mac maven Neil Shapiro,* ***MacUser*** *has a strong how-to emphasis, a constantly updated 12-page section of capsule software reviews, and crisp, flashy graphic design. I hope it's around for a good long while.*

Finally, if leafing through the three preceding magazines each month in an effort to keep well informed is too much to take, ***MacBriefs*** *may be the answer to info overload. Or is it?* ***MacBriefs*** *boils down all the Mac-related articles in the computer press every two months into hundreds of one-paragraph abstracts and summaries. This is mighty handy, though at 76 jam-packed pages the first issue's exhaustive summary of most of '85 (over 1000 items) can give an overload in its own right. Still,* ***MacBriefs*** *has a good idea here which, if your time is at a premium, is well worth a shot.* —Jay Kinney



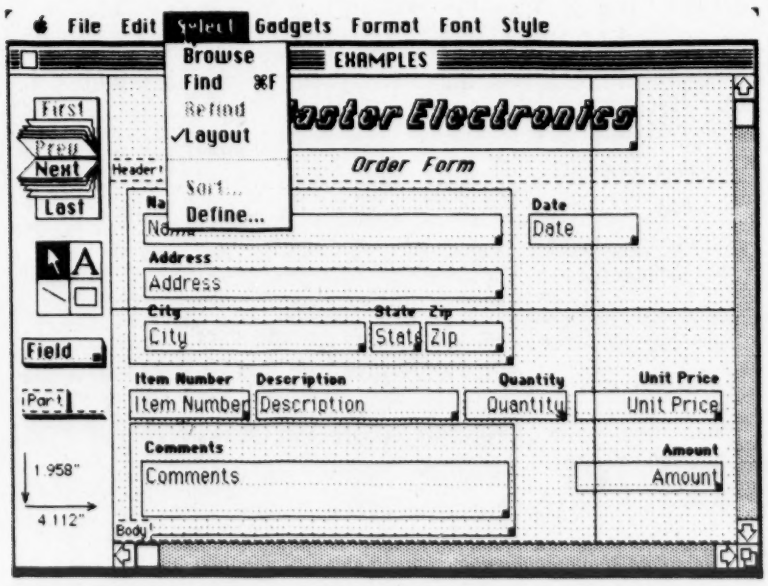
Macworld
Jerry Borrell, Editor
$19.97/year
(12 issues) from:
Macworld
Subscription Dept.
P. O. Box 51666
Boulder, CO 80321-1666



The MACazine
Christopher Wilde, Editor
$18/year
(12 issues) from:
Icon Concepts Corp.
P.O. Box 1936
Athens, TX 75751

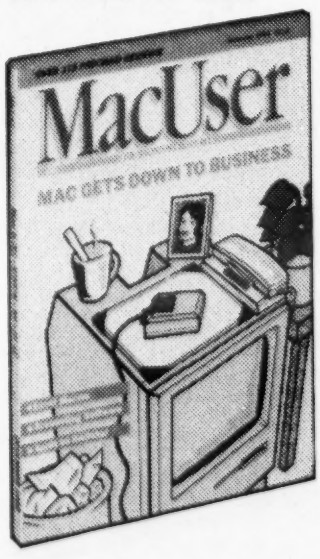
•

Online conference on MAUG with Andy Hertzfeld. Excerpts from comments: On double-sided drives: Haba's drive is likely to be different from Apple's and should probably be avoided. On Mac: color be a long time coming, probably not even in 1986, but larger black and white screens in several sizes likely first half '86. On Imagewriter II: new Imagewriter coming is faster with nicer print quality. On Switcher: 4.0 will be the release version coming soon. —*MacBriefs*

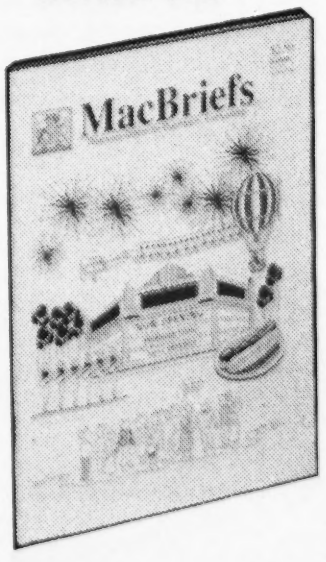


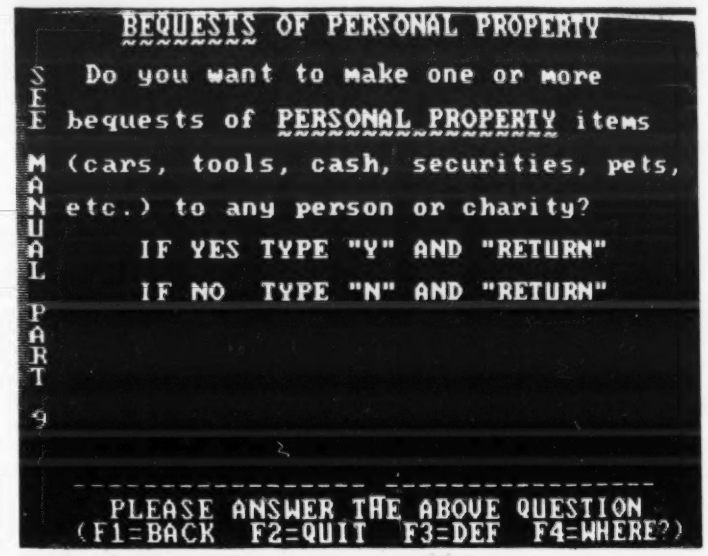
An example of a well designed record which takes advantage of several designing tools: the T-square (in the right hand part of the layout), the grid (represented in the underlying pattern of dots). Field sizes can be changed by dragging the dot within a field into the preferred direction. The coordinate system in the lower right indicates the position of the T-square in inches. —**MACazine**

MacUser
Neil L. Shapiro, Editor-in-Chief
$23/year
(12 issues) from:
MacUser
25 West 39th Street
New York, NY 10018



MacBriefs
Taylor Barcroft, Editor-in-Chief
$12/year
(6 issues) from:
MacBriefs
P.O. Box 2178
Huntington Beach, CA 92647-0178





WillWriter

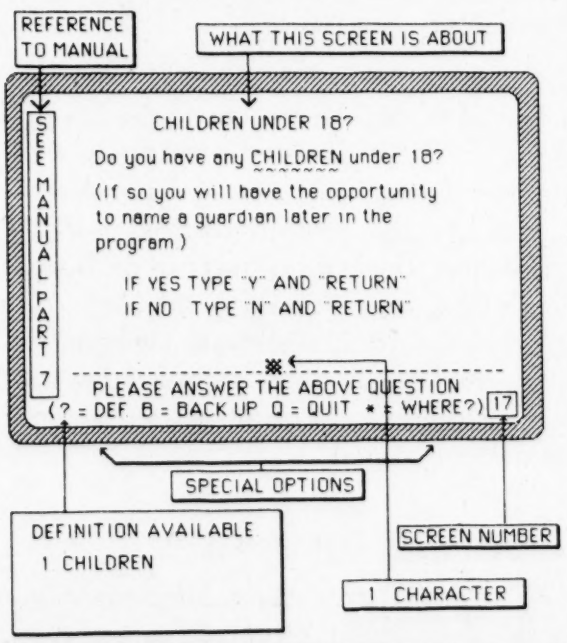
A fertile hybrid that I expect to see more of: can-do software that lives inside a how-to book. In this case, the book itself is one of the better ones on preparing your own will. The will-making procedures have been made precisely methodical in order to please the vaguely dumb logic of the computer. At the same time, the software (slow and somewhat crude) has an articulate book to introduce and speak for it. It's quick enough to think differently depending on what state you say you live in. The combination makes it quite painless to write or update a will.

—Kevin Kelly

•

For people with relatively modest amounts of property (say $30,000-$60,000 or less), a will adequately solves all their estate planning problems because their estate will neither be subjected to federal estate tax nor probate fees. For somewhat larger estates, consideration should be given to passing property outside of probate to minimize probate fees and delays. People with large estates will find that estate planning involves both making a will and reducing the amount of taxable property passed by it.

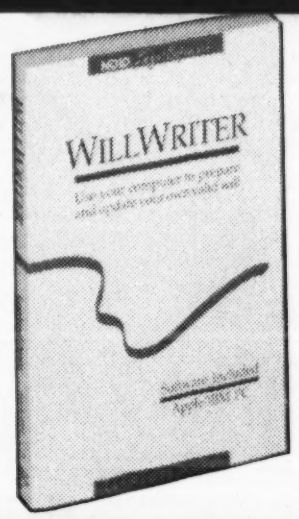
CHILDREN UNDER 18?



VP-PLANNER

Version 1.1. Not copy-protected. $110. IBM PC/compatibles. Paperback Software International, 2612 Eighth Street, Berkeley, CA 94710.

This spreadsheet and database combination is priced right ($110) and not copy-protected (allows you to make back-up copies). On the spreadsheet side, this is a powerful clone of LOTUS 1-2-3, the industry standard, which is copy-protected. Everything works as in the big name product, only for $400 less. If you do not own a spreadsheet, this is the one to purchase. *—Woody Liswood*

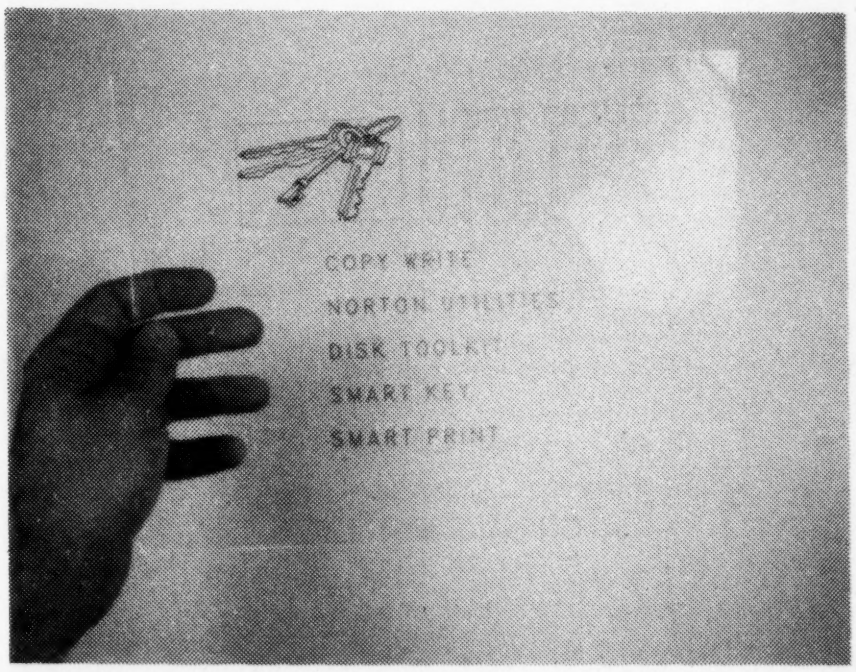


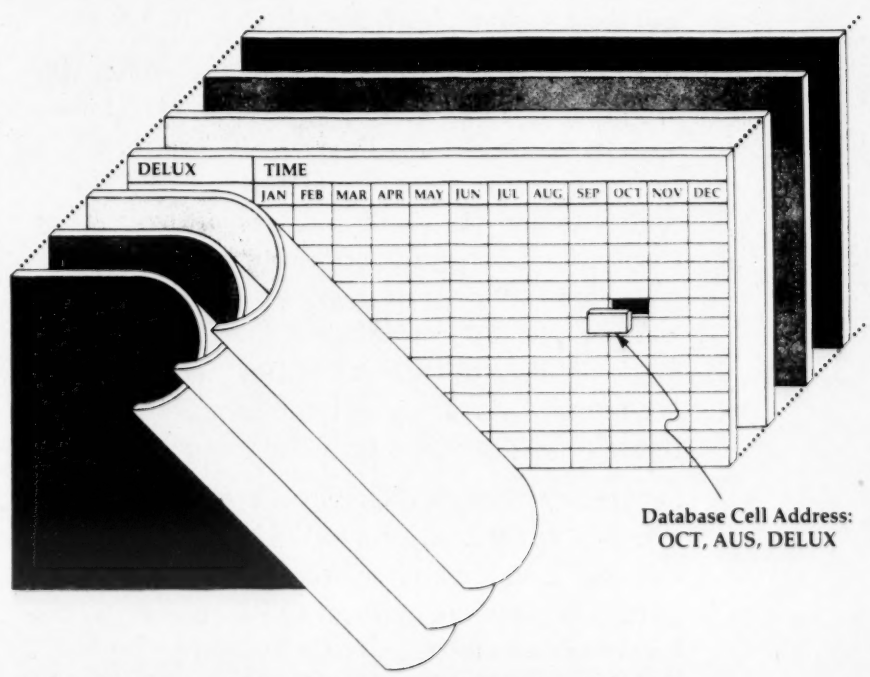
WillWriter
(with software for IBM PC or Apple II)
1985; 170 pp.
$39.95
($41.95 postpaid) from:
Nolo Press
950 Parker Street
Berkeley, CA 94710
or Whole Earth Access

DIAGRAPH

Version 3.3. Copy-protected. $395. IBM PC/compatibles. Computer Support Corporation, 2215 Midway Road, Carrollton, TX 75006.

DIAGRAPH has replaced my other text- and overhead chart-producing graph programs. It drives an HP pen plotter and comes with a library of thousands of illustrations which you can place anywhere you like on a sheet of acetate to make a transparency. The only negative feature is an asinine copy-protection system that requires a "key" disk in the A drive to run correctly. I use the program because it is good, but I curse the copy-protection scheme each time. *—Woody Liswood*





Just as the intersection of a row and a column on the worksheet defines a cell address, the intersection of a set of categories, one from each dimension, defines the address of a cell within the multidimensional database.

A Hassle-Free Guide to Public Domain Software

A pithy update of the definitive text on the subject by its author. For 648 pages of thoroughness, head into How to Get Free Software, *$14.95 from St. Martin's Press, 175 Fifth Avenue, New York, NY 10010.*
—KK

by Alfred Glossbrenner

FREE, public domain software has got to be the best-kept secret in the personal computer world. It sounds almost too good to be true, but if you're interested in writing, graphic arts, music, or conventional hard core computer applications, public domain software can easily save you anywhere from $700 to $1000 or more over the cost of commercial programs.

Public domain (PD) programs are written by private individuals, usually in their spare time. They are not copyrighted and can be copied, used and passed to friends legally. Some authors do retain their copyrights and request a contribution (usually $20 to $35) if you like their work after you try it out. Programs of this latter sort are often called 'freeware,'' ''shareware,'' or ''user supported software.'' But most software authors contributing to this vast pool of treasures voluntarily surrender their copyrights and place their work in the public domain.

All of it, however, is yours for the asking. The only problem is that with over 10,000 programs to choose from, you do have to know what to ask *for.* Assuming you've decided that for one reason or another you need a personal computer and you want to keep costs to the minimum and still get the job done, here are the steps to follow.

First, get an IBM, Compaq, Zenith, or other IBM-compatible computer. Some of the IBM ''clones,'' such as Radio Shack's Tandy 1000, sell for $1,000 or less at discount places. Other non-IBM-like machines are more technologically advanced or better suited for graphics or music or other applications, but are not as widely provided for, especially in the free software field. It's still very much an IBM/MS-DOS world out there, and for the greatest versatility with the fewest hassles, it doesn't make sense to buck the trend.

Second, contact the PC Software Interest Group (PC-SIG) for a copy of their 340-page catalog ($8.95). Local computer users' groups and clubs generally maintain libraries of PD software; contact the computer retailers in your area for help in locating one. But PC-SIG, a mega-users group, has emerged as the informal ''master library'' of free software in the IBM/PC world. Most local users groups periodically send the best PD programs written by their members to PC-SIG to gain wider distribution.

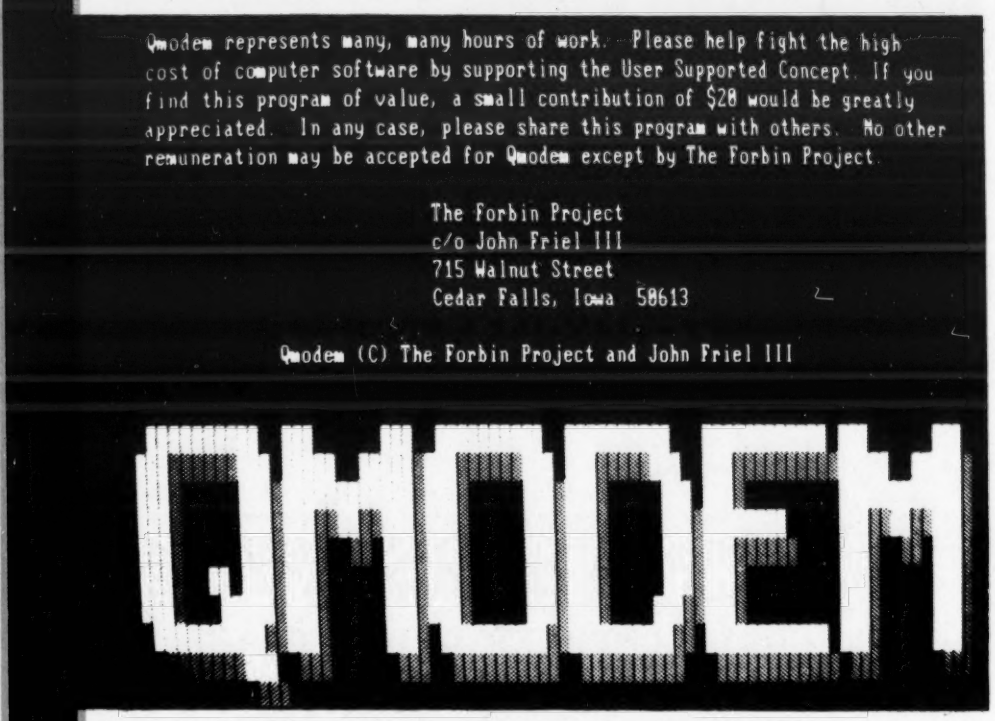
At this writing, PC-SIG has over 450 floppy disks in its collection. Each disk is numbered and sells for $6.00, plus $4.00 shipping and handling per order. Membership (not necessary for purchasing disks) is $15 per year and includes a subscription to the quarterly PC-SIG newsletter. Contact: PC-SIG, 1030 East Duane, Suite J, Sunnyvale, CA 94086. Phone: (408) 730-9291. Visa and MasterCard accepted.

I've gone through virtually the entire 450-disk collection of PC-SIG (representing the best in free software), and I've chosen the programs that are tops in their category. The numbers in parentheses after each program refer to the disks in the PC-SIG collection. These programs are probably available from your local computer users' group as well. Ask the group's software librarian for more information; in this decentralized network the same program may go by more than one name at other places.

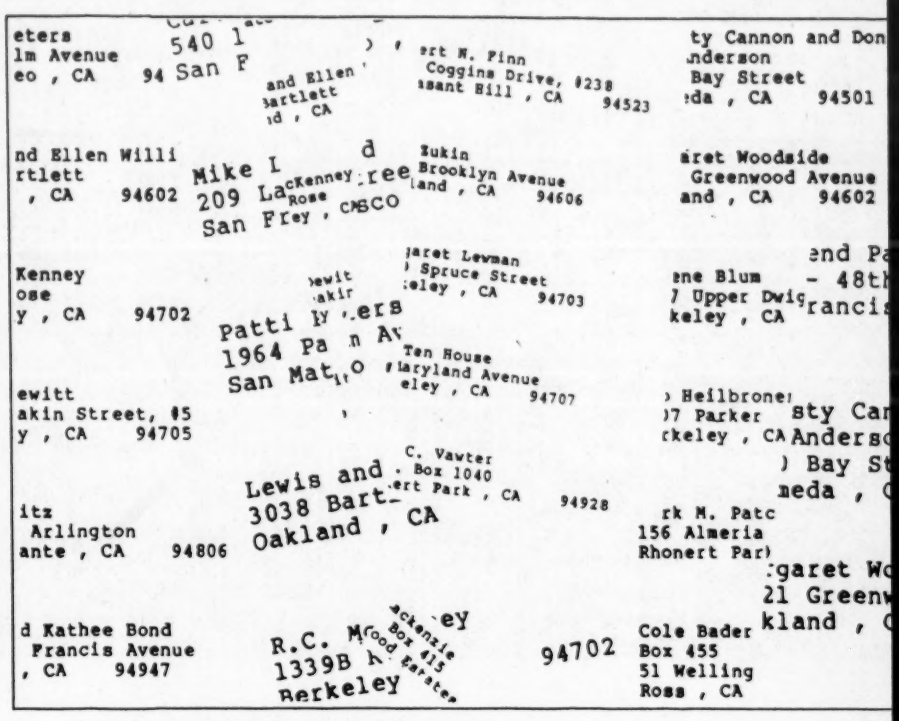
Essentials

WORD processing, information management, electronic spreadsheet, and telecommunications programs are the four building blocks of every personal software collection. The four nearly-free programs of choice in these categories are PC-WRITE, PC-FILE, PC-CALC, and QMODEM. These programs compare extremely well with their commercial counterparts. To my mind, in fact, PC-WRITE and QMODEM are actually *better* than anything commercial producers have to offer.

PC-WRITE (#158) is so much quicker, more ener-



The initial screen of QMODEM displays the gospel of shareware: copy it for free; if you use it, send a contribution; pass it on.



A slew of labels churned from a mailing list compiled on almost-free PC-FILE. As in commercial versions, you can select the format.

energetic, and easier to use than WORDSTAR that I can't imagine why anyone who knew about PC-WRITE would buy that traditional best-seller, even at its discounted price of $265 ($495 list). In addition to a "mail merge" feature for creating "personalized" form letters, PC-WRITE can also produce an index of your work. A soon-to-be-released revised version will be able to check your spelling as well.

For its part, QMODEM (#130) offers all of the best features found in CROSSTALK, the leading commercial telecommunications program. Like CROSSTALK, QMODEM will connect your computer to the phone line via a modem. CROSSTALK costs $195; QMODEM costs the price of a blank disk. QMODEM is much easier to set up and use as well. With features like a "help" window that instantly pops into view and disappears on command, it is in my opinion more thoughtfully designed than CROSSTALK.

PC-FILE (#5) is roughly comparable to the best-selling and widely advertised program PFS:FILE ($84 at a discount; $140 list). It's a capable data base with reasonable limits that will work for 90 percent of your tasks. Not only is its data portable to other freeware programs like PC-WRITE, but you can move its data to commercial spreadsheets if you outgrow its limits. (As with most PD programs an internal manual is included — you print it out. However, some of the key functions of PC-FILE are covered in a manual that comes only when you pay a $49 "contribution.")

Public domain PC-CALC (#199) is actually a more fully featured spreadsheet than PFS:Plan, which at $140 is inexpensive as far as spreadsheets go. It does not have all the whistles and bells of its commercial counterpart, but if you're like most people, you'll never notice the difference.

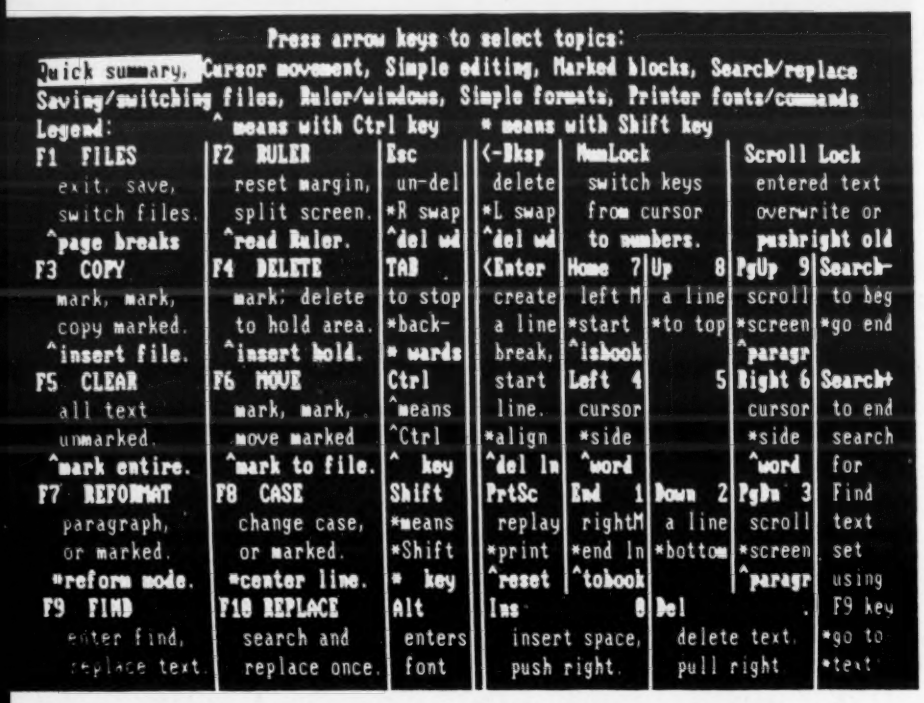
Important Tools

"TOOLS" or "utility programs" are little programs that can make working with a computer infinitely easier (*WER* #45, p. 91). Most can only be found in the public domain. Software companies tend not to produce them because they can't charge enough to make it worth the effort. That's ironic because they're incredibly valuable, capable of saving any user hundreds of hours and untold keystrokes each year.

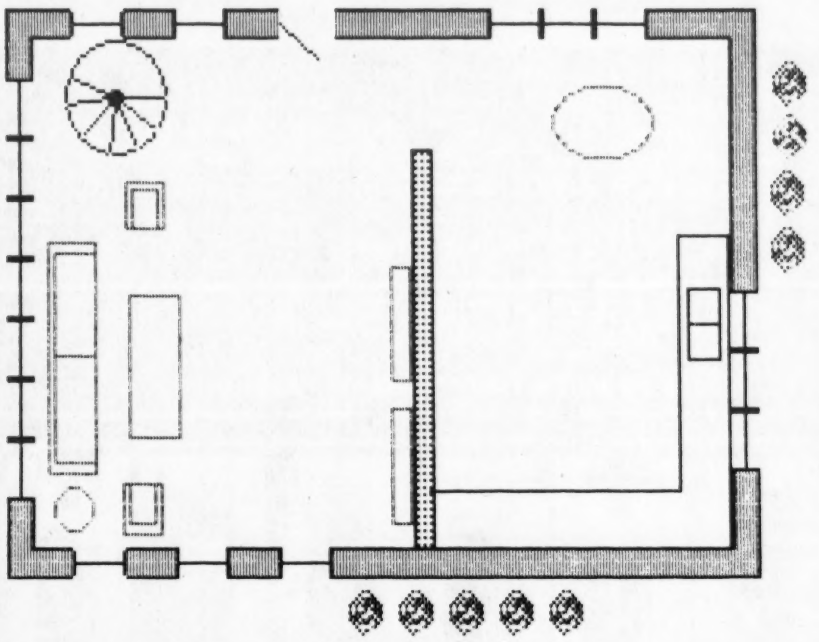
For example, no one should be without a "sorted directory" (SDIR) program capable of displaying the contents of a disk in alphabetical or another order. The best SDIR program in the PC-SIG collection is on disk 255.

I also recommend VFILER on disk 319. This presents all of the files on a disk at once and lets you move a highlighted block around the screen with the arrow keys, marking files to be erased or copied or whatever, individually or en masse. PRINTER.COM on disk 110 lets you control your printer's special features (bold, italics, underline, etc.) by choosing items from a menu. The Ultra Utilities on disk 133 will let you perform the miraculous: you can restore a file that you have mistakenly erased, as long as you discover the error as soon as possible.

NEWKEY, on disk 181, is a public domain version of the bestselling PROKEY ($80 at a discount; $130 list), a program that lets you reproduce entire words, sentences, or commands by hitting a single key. And BACKSCRL, on disk 273, will let you review the last 700 lines that have scrolled off the screen at any time without interfering with the program you are running. ►



The arrangement of the menu screen for "bestselling" PC-WRITE mirrors the arrangement of function keys on the PC keyboard. The left three columns reflect the three rows of gray shift and "F" keys; the gray shift and white cursor pad keys are on the right. The seven other menu screens are equally thrifty and compact.

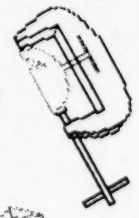


An elementary assignment for multicolored PC-KEY-DRAW is a black-and-white floor plan. It can calculate the room's size as you make changes.

Graphics and Art

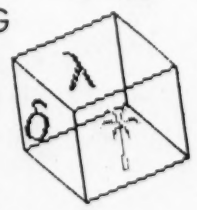
NOW for the fun stuff. There are lots of PD graphics and drawing programs of interest to anyone with an artistic bent. All of them require a color graphics card in your machine, and most provide access to one of two or more "palettes" consisting of three to eight colors each at any given time.

Like their commercial counterparts, these programs typically present a blank screen featuring a tiny "pen point" in its center. The arrow keys (or a mouse) are used to move the dot from place to place in whatever increments you select, and the function keys (F-keys) are used to automatically draw standard geometric shapes. For example, if you wanted to create a circle, you would mark its center with the pen point and then move out to mark a single point on the circumference. Then you have only to press the proper F-key and the computer will automatically draw the circle.



You can toggle a grid on and off to help you place the cursor more precisely or accurately copy a printed drawing. You can "paint" backgrounds and enclosed shapes with colors of your choosing. And you can "cut and paste" by saving a creation on disk, bringing it back to the screen, moving it around, and merging it with another drawing. Some PD graphics programs also include a feature to let you prepare a "slide show" of several images, and many come with a clutch of sample pictures created by the program's author.

The three best drawing programs in the PC-SIG collection are DIGI-DRAW (disk 191), PC-KEY-DRAW (disks 344 and 345), and PC-PICTURE GRAPHICS (disk 136).



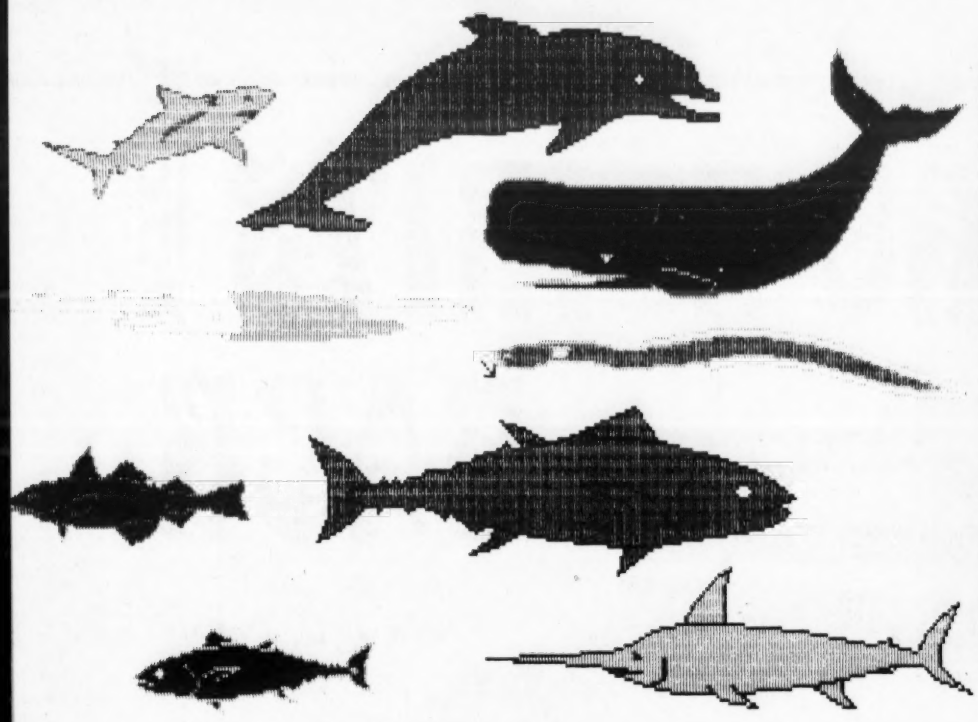
DIGI-DRAW is the simplest of the three. It's a very friendly, well-conceived program that can be used almost instinctively. Though it offers only high resolution black and white, it is the ideal program to start with if you want to begin drawing immediately. It's cheap to try.

PC-KEY-DRAW, on the other hand, is the most sophisticated of the drawing programs. The program's author maintains that an equivalent commercial "computer assisted drafting" program would cost $300 to $700. He may be right. PC-KEY-DRAW is a very powerful program. It offers 19 palettes of four colors each and will not only flip an image over at the touch of a key, it will also increase or decrease its size ("zoom"), invert, rotate, and animate it. It can also calculate the area of an object, locate its center, and even figure its mass based on the information you supply. There are files of sample images and a full slide show module for creating automated presentations.

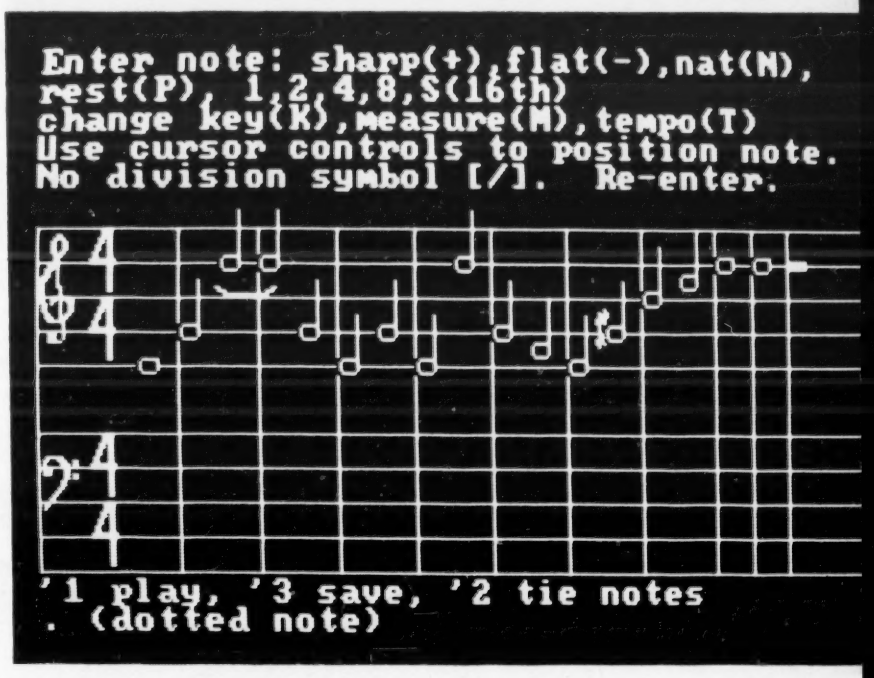
As you might imagine, all this power comes at the expense of ease of use. PC-KEY-DRAW has a lot of commands, and unlike DIGI-DRAW, it's almost impossible to use instinctively. But it does perform.

For the fastest, most satisfying results, however, I would recommend PC-PICTURE GRAPHICS (PCPG). This program does take a bit of getting used to. (Its most exasperating characteristic is that it won't let you draw straight lines and curves without first laboriously switching modes.) But after an hour or so of playing around with it, you'll be in the groove. Shortly after that you'll be amazed at what you can produce.

Though not equivalent to commercial programs like PC PAINT and PC PAINTBRUSH ($100 and $140, respectively; see *WER* #45, p. 86), PCPG



Digital clip art snipped from a library of images supplied with **PC-PICTURE GRAPHICS**. You can design your own, of course. The icons in the margins of these pages are more from the same program.



Don't know how it will sound, but here's a melody composed on the screen of **MUSIC.BAS**, a limited but free introduction to the mechanics of music.

has a certain charm, and you can't beat the price. The program offers two palettes of four colors and five text fonts (including Old English script). It comes with over 270 expertly drawn images ranging from fish, birds, and fleurs de lis to the Greek alphabet, signs of the Zodiac, and flowcharting symbols. Free clip art. Each of these images can be enlarged or reduced, and "clipped out" for use elsewhere. Joysticks, light pens, and digital plotters may also be used with PCPG.

Music

IBMs and compatibles were never intended to be music wonder machines, so their sound producing capabilities are admittedly not the greatest. Unlike the Commodore 64 with its super music chip, PCs have only one "voice" and can thus produce only one note at a time. This is why most commercial PC music programs are primarily designed to harness the PC's graphics capabilities to automate the transcription (music-writing) process, unlike those of the C-64 which do generate passable music. Nonetheless, the single note the PC produces can be made to vary widely in duration and pitch, and the results can be quite impressive.

Most PD music programs follow the same general pattern. They either display a partial piano keyboard with an abbreviated staff and let you enter different notes by hitting different keys, or they present the treble and bass staffs and let you use the arrow and function keys to place and define your notes. Needless to say, all of them will let you record, play back, and edit your compositions.

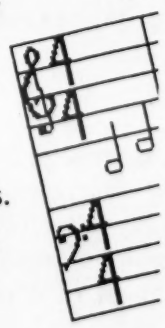
Of the two approaches, the latter is probably the one you will find more productive. It may be interesting to play your computer keyboard like a piano, but it is also distracting and, of course, the fingering isn't even close. The program I would recommend is MUSIC.BAS, a BASIC program that displays both staffs and, after you set the time signature, automatically calculates and marks off the measures as you add notes of different duration. You'll find this program on PC-SIG disk 92.

A good second choice would be PC-MUSICIAN on disk 100. This program operates in much the same way, but it features an instantly available help file listing its many commands, which is something MUSIC.BAS does not offer. On the other hand, PC-MUSICIAN displays only a single staff.

If you're not a musician but simply want to amaze your friends and confound your enemies with the sounds your PC can produce, you'll find lots of disks with collections of prepared music. The tunes range from Bach to The Beatles, and all you have to do in most cases is key in BASICA *tunename* and hit [ENTER] to get them going. Disks 100, 292, and 322 offer particularly rich selections. You'll need a monkey and a tin cup to complete the set-up.

The Deal

FREE, public domain software really is the best-kept secret in the personal computer world: the product of untold hours of effort and creative output, voluntarily contributed for the good of all. The programs I've discussed here are really only the tip of the iceberg. Regardless of your area of interest, I can virtually guarantee that you will find programs in the public domain that can save you time and money — and provide an awful lot of enjoyment as well. (I haven't even mentioned games!) What have you got to lose? ■



WHEN THE SPIRITS COME BACK

by Janet Dallett

illustrations by B. S. Beaver

Madness is a bit spooky. No control knob. Hope it doesn't seize us. So we tiptoe away to watch how it shakes the lives it does grab. Jane Dallet moves closer. She's a painter of watercolors and pastels living in Washington state, age 53. As a practicing Ph.D. in psychoanalysis, she mends irrationality by employing it — inserting dreams into the circuit loop to switch it. She tells a slightly longer version of this story in the current issue of Voices, *a journal of psychotherapy ($50/year from the American Academy of Psychotherapists, 215 E. 11th Street, New York, NY 10003).* —Kevin Kelly

THIS IS SARAH'S STORY, BUT IT IS ALSO MINE. A year and a half before we met, I left my analytical psychology practice in Los Angeles, along with professional responsibilities at the C. G. Jung Institute, and moved to Seal Harbor, a small town in the Pacific Northwest. I had no plans. Putting aside preconceptions about what my life should be, I waited, listening for the inner and outer voices that would tell me what might be required of me here. I took long walks, reflecting on my dreams, thoughts, fantasies, and feelings, paying careful attention to how I was moved to spend my time when I could do anything I chose.

My last year in Los Angeles had been a nightmare of growing disillusion with professional life. I cared about the psyche, about dreams, and about people, but found myself increasingly enmeshed in status and power considerations that had nothing to do with my deeper concerns. In fact, the more successful I became, the less able I felt to serve life or soul. More than once I dreamed that my environment was filled with poison. Soon after dreaming of a funeral at the Jung Institute, I decided to leave.

Away from the distractions of a heavy schedule and big-city stimulation, I soon began to experience the impact of what is buried in the earth of this country. Without knowing at first what affected me so deeply, I was touched by aspects of Native American tribal consciousness that appeared to seep through the soles of my feet. One day I "saw," behind the eyes of a psychologist friend, an immense Indian chief gazing at me with longing, yearning to be set free from imprisonment in an alien white body. The same week I noticed the designation "Redman's Cemetery" on a map. I spent several days searching for an Indian burial ground, but I found only traditional marble headstones with names like McGuire and Scott.

A visiting psychic said my house and the surrounding forest were swarming with Indians. A mediumistic friend dreamed that she met me on the street and saw earth on my face. I looked, she said, like an old Indian woman.

I remembered the dream my student Joseph had told me soon after he dropped out of the analyst training program several years earlier. He was working on an archeological dig in his dream, apparently alone. At first he saw only fragments, a piece of bone here, a shard there. Gradually he became aware that others were digging too, in many different places not necessarily visible from where he stood. Finally he was shown the scope of the project. He and others were excavating the remains of an enormous animal that extended from one coast of North America to the other. Even I had wondered if Native American consciousness could be the buried creature in his dream.

I began to learn what I could about the people who first occupied this land. I spent long hours in anthropological museums and hiked for miles to experience the power spots people told me about when they learned of my interest. Meanwhile I read, finding out what I could about Native American life, legends, art, and healing practices. I was struck by the respect for truth, for nature, and for the heart in what I learned of tribal consciousness. In it I discovered a humility and a capacity to live with other human beings that is profoundly lacking in the superimposed European culture. I saw in Native American ways an integration of healing and art into life, a refusal to cut the living fabric that is woven simply and naturally into unified patterns.

Immersion in this land and the material it exposed me to took me inexorably deeper into mistrust of my profession. My consciousness was too developed just to imitate Native American practices, but neither could I continue to ape the professional forms I had been taught. Six weeks after moving I resigned from the professional organizations to which I belonged.

Two months later I had a terrifying dream: *I awake knowing that in the night the Bomb has dropped. I am near the epicenter and am contaminated with radiation. A few people reach toward me, wanting to touch me. Most avoid me. If they touch me they will be irreversibly contaminated.*

The next day the one strong professional connection I had maintained was unexpectedly and precipitously severed. Suddenly I found myself alone with a terrible need to break old molds and an equally terrible guilt. Seeking friends with whom I could talk about the psyche, I found more emotional support, psychological depth, and good instincts among ordinary people with no psychological training than in many members of my own profession. I began to value the human condition in a new way and to deplore the exaggerated sense of specialness that adheres to professional practice.

Slowly absorbing my radioactivity, I reflected about the separation that exists between every-

day life and the practice of analysis. Professional analysis carries the bias of the Judeo-Christian era, wherein attention has been paid to the tree of knowledge but the tree of life has all but disappeared. That is, the profession values knowledge, but does not always further the process of living. Too often life is "understood" out of existence before it has a chance to happen.

The forms of analysis protect analysts from certain hard things, but do not necessarily serve either patients or the psyche. Instead, they foster an arrogance of professionalism that must be left behind if we are to mediate the psyche's healing capacities. Rooted in European tradition, psychoanalytic forms have a precarious existence on this soil in any case, unconnected as they are to the native psyche. The psyche behaves as if it wants to bridge the gap, not to regress to primitive forms but to decrease the disparity between analysis as it is practiced and life as it is on this continent.

Seeking to reduce that split in my own life, I began to experiment with conditions that would push the limits of traditional psychoanalytic models and integrate the work more deeply with the spirit of life and nature in the Pacific Northwest.

Just then I met Sarah. It was my second September in Seal Harbor, just before the spirits came back.

Native people say they do practical things in spring and summer. They fish, gather berries, and prepare to sustain themselves through the long, dark winter. The spirits are away then, in the underworld, doing whatever they do there. In autumn, around the time of the equinox but not precisely then, they come back. Then the People go into their longhouses and tell stories, dance spirit dances, gather songs and poems, and live with the spirits all winter long while the bears hibernate.

When the spirits arrive in Seal Harbor you know it. The winds come and the tourists go home and the air is alive with *something*. When they came that fall, I wanted to paint again. All the artists I knew said, "Don't take lessons, just paint," but I felt insecure and looked for a teacher. Someone told me that Sarah offered a good class, and one day in September I telephoned her.

Something peculiar happened. After I identified myself and made my request, there was a long silence. Then Sarah began to talk. She talked for a long time. She was explaining why she would not give another class, but I had the eerie feeling that she had found her way into my head. She spoke of what was on my mind, about an incompatibility between professionalism and life in the community.

As abruptly as she had begun talking, she stopped. Another silence followed. Then she asked, "Are you a *trained* Jungian analyst?" I assured her that I was.

"In that case," she said, "I might like to arrange a trade with you."

I said, "Oh. Then let's meet and talk about it." We did not talk about it. We made no formal arrangement. For almost four months we met at roughly two-week intervals and talked about whatever came up. Sometimes she came to my house, sometimes I went to hers. Occasionally her infant daughter Katy was there, sometimes her husband Sam.

Sarah showed me slides of her work, critiqued mine, and talked about the psychological significance of color. Gradually, in bits and pieces, she told me her story.

Before she moved to Seal Harbor, Sarah lived near Mount Saint Helens in southern Washington. One day her inner world began to fall apart. Growing more and more disturbed as the days passed, she and the mountain erupted almost simultaneously. It was the volcano's first eruption, Sarah's fourth. Against a backdrop of falling ash, gas-masked people and impassable roads, her friends tried to find help for Sarah while she felt herself splitting apart as if she were standing on the earth and trying to hold the moon in its orbit.

The discrepancy between the feminine spirit (Moon) and the reality of Sarah's life as a woman (Earth) was too great for her psyche to bear. Like so many women in our time, she tried to heal the split with her own body, forming a bridge between the Earth and the Great Goddess of the Moon who in this time, becoming autonomous, refuses to stay in her ancient orbit.

Eventually Sarah was hospitalized. In the hospital she felt invaded, depersonalized, denied permission to do the work she felt she must do, preventing the Moon from crushing the Earth while holding the feminine archetype in some semblance of connection to life. "If only," she mused, "my friends hadn't been so frightened. I was all right. I had to do what I was doing. I wish they could have just understood and supported me in it. Instead they distanced themselves and assumed that what I said had no significance."

She remembered one doctor who was kind to her and seemed to understand what was happening. Only one. When she saw a terrifying presence and asked him to do something about

She and the mountain erupted almost simultaneously. It was the volcano's first eruption, Sarah's fourth.

it, he knew enough to stand between her and it. She was grateful for the simple gesture that took her seriously.

"It happens every five years," she told me. "When did you say was the last time?"
"1980."

It was not hard to figure out. Now almost 39, Sarah was approaching another break. When I asked if she thought that was so, she changed the subject.

Our next few meetings were punctuated by Sarah's more or less indirect questions, designed to discover my attitudes about psychosis and particularly about hospitalization. I told her that I had, on occasion, worked with psychotic episodes outside the hospital, when light medication could be arranged and a family member was willing to carry 24-hour responsibility. Twice I had insisted on hospitalization. In both cases the men had guns and threatened to use them, one on himself, one on someone else.

Later she asked directly, "What would you do if I called on you the next time it happens to me?" I laughed. "I suppose," I said, "I would ask you what you were experiencing and take it from there." I showed her *The Far Side of Madness,* a book by John Perry, and told her of attitudes I shared with him, that some psychoses constitute the psyche's attempt to heal itself; that hallucinations, delusions, and so-called bizarre ideation are like dreams, which, if properly understood and integrated, carry a process of development rather than ultimate disintegration. I expressed the hope that if such a process could happen in the right way, it might not have to repeat itself.

The dynamic of psychosis manifests primitive levels of the psyche that polite contemporary society has all but buried. Specific content may be very modern, but the process, the pull to madness itself, is very old. It is the call to the spirit world that finds so little legitimate space in our materialistic culture. The psychotic's task is exactly the same as the analyst's: to connect this world with the other. The Native American mind knows enough to give special status to what our mind labels psychosis. In it may lie the call and initiation of shaman and healer.

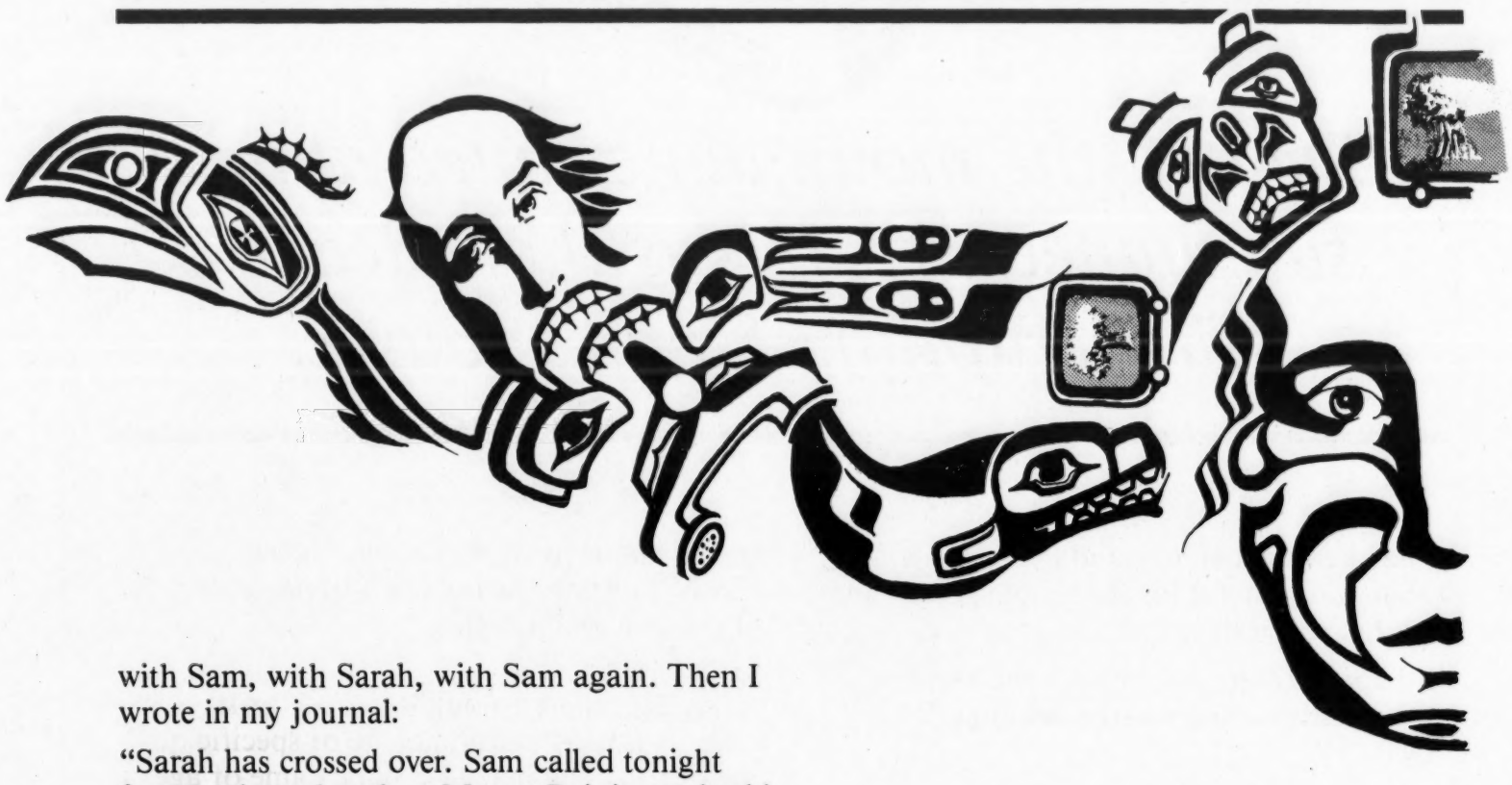
Sarah and I had no contract, not even a verbal agreement, but I felt bound by my implicit promise to her. The evening of December 30, 1984, she paid me a visit. With her she brought an uncharacteristically decisive manner and a brown paper grocery bag filled with books. She emptied the books on the floor — 16 novels by the same author. This man, she explained, had raped her when she was 19 years old, and now she was going to turn him in. She had compiled a dossier on him from his writings.

Something about the way she spoke puzzled me. I remembered that she was first hospitalized at 19. Clearly she *had* been raped at that time, but was it a literal, outer-world rape or had something else happened to Sarah for which rape was an adequate symbol? I felt uncertain.

Suddenly, in mid-sentence, she put the books back into their bag, took a deep breath, leaned back and began to talk in a different way. Clearly and without pausing she told me first about her mother's murder, when Sarah was six, shot by a lover who then committed suicide. Next she described a series of difficult relationships with men, culminating in her first marriage. She had felt misunderstood, betrayed, and abandoned each time, her inner experience and feelings rejected or ignored. Finally she told, in detail, about each of her four hospital experiences. When she finished her recital, she stood up to leave. I observed that the rapist had taken many forms in her life. She nodded and left with her bag of books.

The following Saturday, Sarah's husband Sam knocked on my door and asked if we could talk. He was troubled by the way Sarah had been acting and wondered if she were on the edge of a breakdown. They were leaving that night for a ski trip on Mount Rainier, and Sam hoped the wildness of the mountain would calm her. I agreed that it might, but I felt uneasy and urged him to call if I were needed.

The next night the telephone rang. I talked



with Sam, with Sarah, with Sam again. Then I wrote in my journal:

"Sarah has crossed over. Sam called tonight from a phone booth at Mount Rainier and told me Sarah is having a hard time. When I talked with her she said Sam's father was standing in the middle of the road with cars whizzing past, in terrible danger (a hallucination). I asked her what kind of a man he is, and she described *the most* wonderful, stable human being. I said, 'It must be terribly scary to have him in such danger.' She said yes. I asked if she wanted to come home. She said, 'Definitely!' Sam wondered if it could wait until morning and she agreed. I asked if I could do anything more for her tonight. She asked, 'Can you assure me safe passage? There have been a few problems.' I hesitated. How could I be sure? Then I said I thought I could. She sounded relieved. I will see her tomorrow."

That night I dreamed: *I pass by David's office and stop in. There is a packed suitcase in the middle of the floor and the place is a mess. I realize that Sarah went to see David professionally once or twice long ago, before I knew her, but she was dissatisfied. I leave his office and go to see Sarah. She is doing very well, almost fully recovered from her psychotic episode.*

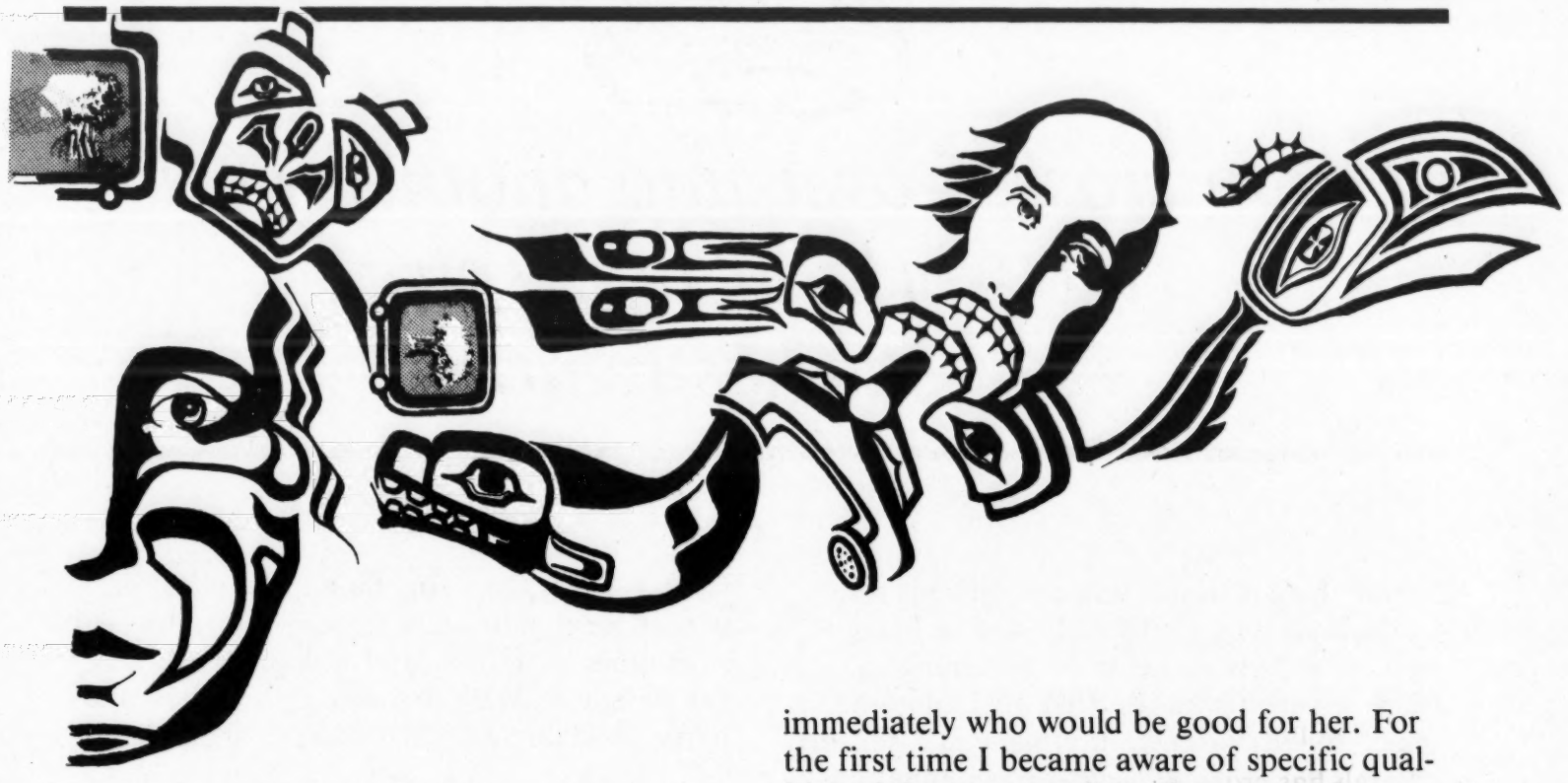
Sarah's appearance in my dream reveals and clarifies my inner connection with her. David is an outstanding analyst who works in a traditional manner, but not too rigidly so. He appears to be bright, creative, competent, and kind, a living image of the ideal psychotherapist. In the outer world Sarah had never seen him, but *I* had been his patient for a time and the Sarah within me had not been satisfied. Unrelieved light, beauty, order, truth, goodness, reason and moderation are not adequate to heal the primitive, creative woman.

The dream reminded me that the traditional white, masculine analytical model can no longer carry the healing archetype for me, no matter how perfectly the work may be done, because it is too separated from the wounded one, too disidentified from the wildly irrational, creative, primitive psyche. The doctor-patient archetype has two poles that are bound together in the healthy person. The analyst who identifies too much with Doctor, forgetting that he is also Patient, fails to activate the self-healing power of the psyche in his outer-world patients because he unconsciously needs them to remain sick. The office of the traditional analyst is a mess and is ready to be left.

Coming as it did at this moment, on the brink of Sarah's break, the dream gave me clear warning not to fall back into old professional ways. She would not find her sanity in "David's office." That in the dream Sarah was doing very well also encouraged me to trust her outer-world counterpart's capacity to achieve safe passage.

Sam and Sarah did not reach home the next morning. Scenery whizzing past the moving car was more than Sarah could bear, and they stopped at a friend's house in the woods some distance from Seal Harbor. Responding to Sam's call I found my way there, knocked on the door and walked in, feeling a little like Goldilocks. Sarah lay on a couch with her eyes closed. I said, "Hi, Sarah." Without opening her eyes she said firmly, "I will speak with no one but the Pope." And so it began.

Later that day Sarah pushed me away and ran about the room screaming, "Tabu, tabu, tabu! I am tabu! Don't touch me. I am contaminated." My dream of the Bomb came back to me. I said, "No. You are not tabu. I want to touch you. You don't have to carry it all by



yourself." We worked on decontamination rituals repeatedly during the days that followed.

I did little to intervene in Sarah's healing process, beyond taking on some of her contamination and asking a helpful physician to prescribe very small doses of anti-psychotic medication through the worst of the episode. That afternoon she was able to go home. I telephoned some friends and asked if they would help by being with Sarah a few hours every day. They, in turn, called people they knew. Before it was over, 25 community members in addition to her family had become involved. As long as it was necessary, Sarah had at least two people with her 24 hours a day. After five days she announced, "There is too much energy in this room. Some of you will have to leave." The "staff" was reduced accordingly. In a few more days she was able to manage her life again without a lot of extra help.

At the beginning, things happened too fast for me to give even brief instructions to the people who appeared at the door to be with Sarah. When there was a chance to communicate I said only: 1) Sarah is in an all-right space. Try not to be afraid of it. Fear is not good for her. 2) Be yourself as fully as you can. If you need to protect yourself, either physically or emotionally, do it. 3) Do whatever you can to understand what Sarah is trying to say and where she is at any given moment, without trying to change it. 4) Sarah's task is to build a bridge between this world and the world where she is. If you see any way to help her with that, do it.

Sarah's approval was required before anyone was permitted to spend time with her. She knew immediately who would be good for her. For the first time I became aware of specific qualities of the counterculture that came of age during the sixties. The Vietnam war, psychedelic drugs, and the overriding chaos of that time left many human beings now in their 30s and 40s deeply wounded. Some, of course, have covered up the damage and successfully identified with the cultural norms of their parents. Others are hopelessly lost. Still others have remained close to their wounds, without making woundedness a virtue, and are thereby blessed with singular compassion and a fundamental knowledge and trust of the primitive psyche absent in most of us who are older. These were Sarah's companions through her most vulnerable time. Insofar as possible, we protected her from people too unconscious of their own wounds, too identified with "health."

For my part, I struggled daily with the "David" in me, who dared not trust Sarah's process and wanted to yield to pressures to hospitalize her, to administer heavier doses of drugs, or to try in other ways to save her from her experience. I was at moments shocked and frightened by the extremes to which her psychosis took her. What if she hurt herself, or committed suicide, or had an accident, or never came out of it at all? In this small community, where everyone sees everything, I would surely be burned as a witch!

This is the crux. I never had a serious doubt about the best treatment for Sarah, but in choosing the best for her I put myself at risk. Those who know and can activate the healing power of nature touch ancient hatreds. For centuries, white-man healing has meant flexing the muscles of ego control, trying to subdue and dominate nature. Anyone who cooperates with nature in the Native American way stirs up old fears, arousing the awful suspicion that nature remains bigger than we are and will finally get us all. ►

Sarah crossed over into another world, the world of pure spirit. Now she has returned.

Where there is death, however, there is also birth. Images of giving birth and of being born were daily events in Sarah's imagery. Many other themes recurred, including the search for her mother, interplanetary warfare, and the ever-present nuclear contamination.

One day she asked, a look of wonder on her face, "Did you know there are all these little fishes in the underworld?"

In touching Sarah we were all drawn into her inner space and were in turn connected to the deepest parts of ourselves, the stuff of mysticism, creativity, and madness. As the days passed I became aware that contamination by Sarah's process brought healing to everyone who participated, each in a different way. In addition, it contained the possibility for healing something larger than the sum of individuals, a malaise in the community among us. When a culture has, like ours, become so rational and controlled that it is in fact insane, the totally natural and irrational may be our only sources of sanity.

On January 9, Sarah took all the pictures in her house off the walls, "to avoid breakage." At 5:30 the next morning an earthquake shook Seal Harbor. The earth stabilized only a little sooner than Sarah. On January 14 she was able to come to my house for a therapy session, wearing a jaunty hat. With a mischievous smile she explained that it was her "halfway hat."

During that session she became quite agitated and revealed that a woman had refused to go on a trip with her and Sam because of Sarah's "mental condition." We talked about the fact that a lot of people feel that way. She had met such attitudes many times before, but the quality of her experience during this episode had left her open, unprepared to meet those who could relate to her only on socially negative terms. True to her new hat, our work was only half finished. Sarah had reconnected to herself, but she had still to find her place in the community.

Colette, who had been with Sarah during the darkest nights of psychosis, suggested we all meet together. Not only Sarah, but all of us, needed a ritual in order to be comfortable with each other in the world of ordinary reality. A few days later Mary dreamed that we had a party to celebrate Sarah's successful passage.

Theoretically it sounded like a good idea, but when I imagined actually doing something of the sort I felt embarrassed. All very well to be so unconventional while Sarah was mad, but *now?* . . . The inner David threatened to engulf me. I struggled for several days before accepting that I had gone too far along my path to leave it now.

Meanwhile, Sarah made a blackberry pie and celebrated her mother's birthday for the first time ever. The following weekend Sarah, Sam, Katy, and 16 friends joined me in a ritual followed by a potluck dinner. Winter Wolf, a contemporary tribal drum, gave forth the native heartbeat of the earth until everyone was seated. Then I put on a ceremonial robe and spoke:

"Colette imagined and Mary dreamed that we gathered together to make sacred the event in which we have all participated, to acknowledge and celebrate our mutual bond. We have come here today to do it. Sarah crossed over into another world, the world of pure spirit. Now she has returned, successfully and safely, to the world of ordinary reality. She went to find the mother who was murdered when Sarah was a small child. She came back with a new name that was given her there, a secret name to hold in her heart. She came back with poems and with ideas for new paintings. She gave birth to herself and will be with us here in a new way, a part of this community as she has never been before.

"Sarah, we rejoice with you for your safe passage, and welcome you into your new life here. You made your journey for all of us, not for yourself alone, and each of us has been with you during a part of it. Recognizing the importance of what you have done for us, Rose has made you a pin, silver with lapis and a sliver of moonstone. Wear it proudly as a sign

of your passage. Silver and moonstone hint at the feminine nature of your crossing. The circle of lapis signifies the enduring wholeness you can achieve if you complete your sacred task. For yourself, and for us, you have been called to build a bridge to the other world, a bridge of poems, paintings and tellings of what you have learned, what you have seen and experienced. You are asked to heal a painful separation between this world and the world of spirit. We share this profound wound with you. Almost all men and women in this culture participate in a split between everyday life and the life of the spirit.

"The traditions, even the language of Western medicine are harsh and unconnected to what we who are here today have experienced. Driven by fear and ignorance, traditional medicine and psychology call people like Sarah schizophrenic, crazy, insane, thereby justifying shutting them up in hospitals, cutting them and the rest of us off from the healing process that the psyche is trying to accomplish. Sarah pointed out to me the other day that schizophrenics don't get colds; and I told her about the fact that schizophrenics don't get cancer. Colds and cancer are the two primary diseases of this time and place. Both can be cured by schizophrenia! Think about that.

"The psyche knows how to heal itself. In passages like Sarah's, what we have to do is pay attention and take seriously the processes the psyche initiates, the language and images it gives us. Other times and places have been more connected to the spiritual realities that Sarah has experienced and the rest of us have experienced through her. Ancient religious mysteries, contemporary mysticism, and so-called primitive people all know about death and rebirth, the dark night of the soul, transformation, vision quest, shamanic initiation. These are the ways, the languages and images of spiritual reality, that inform psyche's self-healing.

"Sometimes a transformation process is long, slow, and undramatic. Sarah's has been sudden and dramatic. Throughout her experience she spoke frequently in images of nuclear energy. It is as if a nuclear explosion took place in her psyche. We all felt the enormous amount of energy that was released, physical energy transformed abruptly into spiritual energy, body becoming psyche. We all worried about when Sarah — and therefore all of us — would begin to get some sleep. But so much energy had become available to her that she didn't need to sleep. Some of us heard Sarah say she had become contaminated by the radiation that had been released. Those of us who insisted on touching her anyway, who agreed to enter into this process with her, have in fact taken on some psychological radiation. We have experienced it in various ways, some positive, some negative.

"We all know that nuclear energy can be used either destructively or creatively. All of us here need to find creative and constructive use for what we have been through together so we will not be hurt by it. For better or worse, the Age of Aquarius is also the nuclear age, and we are the people who must find ways to live together and work together to carry the power of the psyche, the power of experiences like Sarah's, instead of washing our hands, isolating ourselves, and sending our scapegoats out alone into the wilderness as generations before us have done.

"I have been deeply moved by the spirit of love and community that has come forth from all of you. Several of you have told me that your participation in Sarah's crossing has been extremely important. I'm going to stop talking now and hope that some of you will tell Sarah and the rest of us what the experience has meant to you."

Almost everyone spoke. Before we ate together, Sarah spoke too, and read a poem that came to her in the other world.

This was Sarah's story, but it was also my own. As I try to work in ways that touch tribal consciousness, I begin to experience the fabric of community revealed in the depths of the psyche. Threads were severed and the pattern badly obscured so long as I sat with patients only in my office, speaking to no one of what I saw there, cutting and labeling and handing down *ex cathedra* pronouncements, taking everything back to the ego as if there were no world out there, tearing the fabric so badly I missed it completely, missed my patients' lives and mine.

The Native Americans know that in telling our personal stories we become connected to the larger tale the spirits are trying to bring into the world. Alone, each of us receives a small piece of the story, a piece essential to the whole. By telling, and listening, and putting together the fragments we hear, we get inklings of something larger. When we can live in conscious acceptance of the whole story, personal matters will find their proper perspective, and we will be able to live with one another. Then I imagine analysts will be obsolete. We will all be able to activate the healing function in each other as a natural and integral part of life.

But that is far in the future. Now it is February. Soon, around the time of the spring equinox, the spirits will go back to the underworld and the tourists return to Seal Harbor. ■

27 GATE FIVE ROAD SAUSALITO CA 94965

Legendary Mail

(Urban Legend Update)

by Jan Harold Brunvand

My examples of urban rumors and legends-in-the-making, and my plea for more information from readers (*WER* #48, p. 124), netted me close to 200 letters in three months, and they keep on arriving at the rate of three or four per day. Letters have come from 30 states, plus Canada, Europe, Barbados, and Japan. An example:

> This one ran under the caption "Roast Rosa" in the S. F. Chronicle about 10 years ago: A Swiss couple is vacationing in Hong Kong. Childless, they are accompanied by their doted-upon French poodle Rosa. They enter a restaurant, order, and request some food for Rosa. Chinese waiter doesn't understand. They point to Rosa and to their mouths, making eating gestures. Waiter's face lights up, he takes Rosa under arm and heads for kitchen, also making eating motions and reassuring nods to couple. They wait endlessly for their meal. Finally it arrives: Rosa roasted on bed of bamboo shoots. Couple hysterically hospitalized. —Joyce Power
> Tiburon, CA

To my surprise, probably the most-mentioned legend was the one I call "The Nut and the Tire Nuts." Perhaps this was because many readers wanted to show me that they could solve the puzzle posed in the plot: that of how to overcome the problem of lost nuts from a tire being changed. The solution — borrow one nut from each of the other three wheels, then drive to the next town to replace the lost ones — generally is given by an asylum resident or escapee. Readers all over the country and abroad knew this one, either from oral tradition or print, and both as a localized "true" story and as a fictional joke with the punchline, "I may be crazy, but I'm not stupid." To suggest the range of replies: Richard Marsellos of Nacogdoches, TX sent me the version he first heard some 25 years ago, applied to the Rush State Mental Hospital near Dallas; and Chris Brown of the Shetland Islands described how he heard it 13 years ago, told by a visitor to his school class in the village of Walls in Shetland.

The story I call "The Colorectal Mouse" also drew many responses; it has been told and believed in many parts of the country recently, and I got some rather detailed technical descriptions of the supposed diagnosis and treatment of the unfortunate man's (and mouse's) condition. Several of them came from medical personnel, but never from anyone who had directly participated in the case.

A legend that had escaped me is one I call "The Small-World Legend." It seems to stem from some authentic sociological experiments in plotting personal networks that have been widely described in sociology courses. The research was to determine how many connections it took to link two people through mutual friends. In the actual studies, a written message is mailed to someone living near the town of the targeted person. The recipient is asked to mail the message to someone she thinks might be closer until it finally reaches its destination. On the average, five passes were required. In the popularizations repeated by sociology students, this becomes: an oral story is passed to anyone else in only three days. This apparent instance of academic folklore originating in academic reality may be something I can analyze more thoroughly in some future study.

Numerous variant details were supplied concerning the sample legends I cited in my article. "The Mexican Pet" was often mentioned, probably because it came first in my list, and is in fact one of the hottest current legends. In some versions of the story the "puppy" (rat) scratches at the door of a rented Mexican vacation cabin or hangs about near the tent of a camping family. It may be allowed to sleep in a tourist's bed or to share a sleeping bag. It may follow the people around town, and it either snarfs down puppy chow eagerly or refuses to eat any form of dog food. In one version, instead of being smuggled home to the States, it is held in quarantine

by border officials, who quickly recognize the rodent.

Reader Penny Street of Vancouver, B.C. put me in touch with Chris Adkins of Tamahnous Theatre there, who sent me the portion of the script for a play called "The Real Talking People Show" in which "The Mexican Pet" had been used about a year ago as a story overheard from an actual conversation. Adkins wrote me that someone in the company had heard a TV actor tell it on "Late Night With David Letterman," which leads me to think that it was probably *I* who was meant, though the truth is that I told it last year on another national TV interview, but never on any of my three appearances on Letterman's show. Am I becoming a source as well as a collector of modern folklore?

Don Ryan

As examples of other useful notes on stories I had listed, "The Guilty Dieter" was identified by several readers as a story used in weight-watchers' meetings. And three of the legends that I knew only from overseas sources were definitely validated as known either in the U.S. or Canada; these were "The Shoplifter and the Frozen Chicken," "The Turkey Neck," and "The Wrong Teeth."

Many readers sent me "new" stories, most of which (not surprisingly) turned out to be versions of legends that I had discussed in my early books. (So far I have identified 169 urban legends grouped into 10 categories.) These were mostly teen horror stories a la *Vanishing Hitchhiker* like "The Hook" and "The Boyfriend's Death," or crime stories a la *Choking Doberman* like "The Double Theft." I was surprised to find out how lively the tradition still remains of the story I called "The Elevator Incident" in my second book. Previously it was told about Reggie Jackson, but lately it's been pinned on Lionel Richie.

> Three Rochester women recently visited New York City.
>
> The women were on an elevator. A black man got on the elevator with a dog.
>
> The elevator door closed.
>
> "Sit!" the man commanded.
>
> The three women sat.
>
> The man apologized and explained to the women that he was talking to his dog.
>
> The women then nervously said that they were new to New York, and asked the nice man if he knew of a good restaurant.
>
> The women went to the restaurant recommended by the man. They had a good meal, and called for their check. The waiter explained that the check had been paid by Reggie Jackson [Lionel Richie] — the man they had met on the elevator.

Only a few stories were absolutely new to me, but they were beauties. Two of these were in the very large urban-legend category of car stories. "Old vs. Young" is a story about an old woman in an expensive car creeping into a choice parking spot when a young guy in a flashy car beats her to it. He gets out, slams the door and flippantly says, "You've got to be young and quick!" She takes her Caddy and rams the back of his sports car, hands him her insurance card and says, "No, you've got to be old and rich!" "The Crushed Bug" is a story about a terrible truck collision which is later discovered to have been a truck-*car*-truck collision when the wreck is pried apart and a Volkswagen bug with two passengers is found mashed inside. A scandal story I had not been aware of is one I call "The Bothered Bride": a bride delivers a little speech to the assembled wedding guests, accusing her intended husband of sleeping with the maid of honor the night before and telling him to buzz off. The bride's father invites everyone to stay for the reception dinner anyway, saying it would be a sin to waste the food. And one of my favorites was this variation on "The Animal's Revenge," which reader Bert Brown, who heard it in Phoenix, dubbed "The Plant's Revenge":

> A group of men were out in the desert hunting one day. As often happens with so-called "sportsmen," they passed the bottle a few too many times, and by the end of the day were feeling no pain. They had not even been able to bag a single jackrabbit. In frustration, one of the hunters trained his shotgun on a giant saguaro cactus and blasted away a dozen or more times. When he finished his volley, he stood there and laughed at the destruction he had caused, and as he did so, the cactus toppled over on him and impaled him with hundreds of inch-long needles. The man died a terrible death as his friends watched in helpless horror.

The original version also prompted this letter:

> I was particularly struck by the Animal's Revenge and wondered if you were familiar with the saga of Harald Hardrada, Viking warrior and close contender for the throne of England in 1066. . . .

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Don Ryan

The story of Harald and the birds is told on page 108 of David Howarth's *1066: The Year of the Conquest:* "A large part of the army of the Byzantine Empire in that era was formed of adventurers who had come all the way from Scandinavia — a journey which in itself took over a year. Harald quickly rose to be captain of it. . . .

> All the major Mediterranean towns were proof against direct attacks or sieges, but none against Harald's cunning. At one in Sicily, camped outside the impregnable walls, he noticed that small birds were nesting in the thatch of the houses and flying out by day to the woods for food. He set men to catch the birds, bind chips of fir on their backs, pour melted wax and brimstone on the fir and set it on fire. 'As soon as they were freed, the birds flew back to the town to seek their young in the nests. Although each bird carried only a little burden of fire, each set light to the thatch and soon the whole town was in flames.' "

The most fascinating letters of all were those few from writers who asserted that a "legend" plot had actually occurred to them, or to an immediate acquaintance. Sometimes (and this is fairly common in urban-legend studies) the incident thus validated was incorrectly understood by someone to have been told first-person, and double-checking reveals merely another friend-of-a-friend link. Other times the validated experience is close but not exactly parallel with the legend. The rare ones, however, are those that are evidently genuine reports. Two readers, for instance, stated unequivocally that "The Unlucky Contacts" (lenses drunk in a glass of water) had happened — to a brother-in-law in West Virginia this past September, and to *herself* (I'll skip the name) in Maryland five years ago. I first heard it in Cleveland about two years ago and have collected some dozen unverifiable versions since. (Mike Royko of the *Chicago Tribune* also alluded to it as a legend in a column distributed on 2 November 1985.) Moral: not all folklore is false.

My most intriguing discovery as a result of the *WER* article came in a note from Donna DeLacy Celler of San Francisco that began:

> I couldn't believe my eyes! *My* story about the Green Stamps. . . . It happened like this . . .I was in the middle of my third pregnancy, arrived at the OB's office, needed to go to the ladies' room and did indeed substitute a tissue from my purse. A mother's purse is always full of useless and half-used items. I then proceeded into the examining room, hoisted myself on the table and into the stirrups. The doctor (Dr. Tom Nabors of Dallas) sauntered in, said a few pleasantries, and disappeared behind the sheet at the foot of the table. Two seconds later his head appears, his hand grasping green stamps, and he says to me . . . "Well . . . Donna, you giving these out nowadays?" Of course at the time I was mortified, but it didn't prevent me from telling all my woman friends through all these years and in the six cities I have lived since that time. So, I have played a big part myself in spreading the story all over the U.S. I *never* sued Dr. Nabors, nor did I change doctors until I moved from Dallas in 1968. As a matter of fact I loved his sense of humor! Thanks for making my day.

Ms. Celler's account of her experience is essentially the same plot that I had been considering as purely fictional on the basis of three reports scattered from Florida and New York to Utah and collected from 1980 to 1984. The four other California readers who reported "Green Stamps" as a legend had not heard it any earlier nor any more widely distributed than Ms. Celler's experience and movements could explain. The only problems were: 1) the Salt Lake City informant specifically remembered it as a first-person telling (by someone I have not been able to track down), and 2) at the annual meeting of the American Folklore Society in Cincinnati this October I was told a *second* personal-experience version of it directly by a thoroughly reliable, serious source. I'm still working on this one and will report on it in my new book, *The Mexican Pet.*

Finally, I promised in *WER* #48 that I would send thanks to all contributors, but I've not been able to get far enough ahead of the mail and my other work to do so. So far, I have written only to those correspondents whose letters will be directly quoted in the new book. I hope this update will satisfy all the others until I can answer them directly. ■

BACKSCATTER

Echoes from readers back to the *Whole Earth Review* (27 Gate Five Road, Sausalito, California 94965)

Rock of Gaia

For many years I have been telling my chemistry students that living things in photosynthesis changed the whole atmosphere by learning how to use sunlight.

More recently, Lovelock has pointed out that biological control of CO_2 concentration regulates temperatures in the biosphere via greenhouse effect.

Now there is a speculation from Caltech geophysicist Don L. Anderson that Gaia's influence may extend hundreds of kilometers downward and that interactions between life and the lithosphere may have shaped the oceans and continents. Now *that's* coevolution on a grand scale!

In the lead article in a recent issue of *Science* (27 Jan 84), Anderson outlines his picture of the Earth's anatomy and physiology. He bases his arguments on geochemistry and seismic data from the Earth and other inner planets. On p. 348 he writes:

It has often been suggested that life originated on the earth because of a coincidence between the narrow temperature interval over which water is liquid and the temperature extremes that actually occur on the earth. The earth apparently is also exceptional in having active plate tectonics. If the carbon dioxide in the atmosphere of Venus could turn into limestone, the surface temperatures and those in the upper mantle would drop. The basalt-eclogite phase change would migrate to shallow depths, causing the lower part of the crust to become unstable. Thus, there is the interesting possibility that plate tectonics may exist on the earth because limestone-generating life evolved here.

This earthshaking idea seems to have escaped widespread notice, dropped as it was in the middle of a highly technical article. Anderson makes no mention of Lovelock or Gaia, perhaps concurring with Laplace's "Sire, I have no need of that hypothesis." Initiating plate tectonics does rather smack of gathering the waters together in one place and letting the dry land appear, and one can understand why a scientist with a reputation to protect would shy away from anything but the most mechanistic and reductionist view. The rest of us are freer to speculate, and I am grateful to Anderson for a thought-provoking and informative article.

Tom Parsons
Ridgefield, WA

The joke's on us

Re: "Historic Nuclear Park" (by Joy Critchley, *WER* #48 p.1): The trouble with trying to be a satirist these days is that reality will almost always top your jokes. Officials have already initiated the procedure for having West Germany's first power reactor (now decommissioned) declared an historic monument!

Tim Slater
West Germany

An eruption of neglect

In an interesting conversation I had with ecologist Pastrana, he commented that the recent Armero volcano catastrophe here in Columbia was an ecological scream from mother nature. The problem was not the volcano. It was the unprotected way in which the river has been rendered by decades of human neglect, human exploitation of the river banks, and the mountain's lack of trees or other natural barriers against erosion. If all these things had been taken into consideration, and if we had replaced lost forests with new forests, and if instead of planting coffee alone we had planted coffee underneath the shade of big trees, the problem could have been mitigated, and probably many lives could have been saved. Gaia has curious ways of sending messages, and of kicking and screaming and yelling for attention.

Rodrigo
Columbia

Get ready for another century of problems because of cars

Most Americans, including myself, share at least some of Joe Troise's infatuation with cars (*WER* #49, p. 90), and it seems certain, as he says, that they will be with us to the end of the century — and indeed for a decade or so longer, until the cheap oil runs out. However, that's not a solution — it's a problem. Lest we get carried away with oil-glut euphoria:

(1) The individual auto falls into that large class of goods called "positional": that is, the more other people have one, the less satisfying your own becomes. I don't know where Joe lives, but in my 100,000-population city, central area daytime parking is a thing of the past, neighborhood streets are increasingly dangerous, congestion is making even short trip times noticeably longer, and if you contemplate a 20-mile trip you had better allow double the time you used to, in case you hit one of those inexplicable midday freeway clog-ups. What all this is doing to our general civility is also clear: the number of signal-runners, pedestrian-clippers, and general road hogs is multiplying even faster than cars themselves.

(2) The foreign currency the U.S. earns through agricultural exports, roughly $40 billion last time I looked, is just about exactly eaten up by what we spend abroad for oil. What this means, besides its effect on our alarming trade deficit, is that because of the extractive nature of contemporary U.S. agriculture (heavy soil erosion and impoverishment through monocropping) we are selling our dwindling topsoil to maintain our car habit. The situation is even more appalling when you realize we are expending, in order to obtain one calorie of food energy, something like 20 calories of mostly petroleum energy to run farming and processing machinery, produce fertilizers, pesticides, and herbicides, run the (mostly truck) distribution system, etc.

(3) Many real economic costs of personal auto transportation are conveniently made invisible to individual drivers and car lovers — but that doesn't mean they aren't there, crushing us and the general economy. Even our high gas taxes only pay about two-thirds of the costs of roads and highways; the rest comes from general tax funds. And a huge new repair bill is coming due. Auto-related uses consume amazing proportions of our land area (in downtown Los Angeles, more than 60 percent). Adding in insurance, policing, courts, repair services, and so on, the auto consumes more than an eighth of our entire national income, and sometimes more than that proportion of an individual's income. And this doesn't include losses from auto deaths and maimings — direct economic losses in productive lives, not to mention the emotional losses. I'm not sure where the impression comes from that auto deaths are down; now that the 55-mph speed limit is generally disregarded, they are going up again:

Deaths:	Disability accidents:
1983: 44,600	1,600,000
1984: 46,200	1,700,000

Cars are wonderful contraptions, but then so were the Mayan temples, equally voracious in their human-sacrifice requirements. Doubtless we

will go on paying the heavy costs of our cars as long as we can. But we shouldn't delude ourselves that they have survival value for our society.

Ernest Callenbach
Berkeley, CA

Dear Editor,
On your July 85 issue your cover had a couple of flying saucers on it. But I don't think it was very fakey because you should have stopped the traffic and had people standing on top of their cars and a lot of policemen trying to get traffic going and a TV news reporter and a newspaper reporter. Yours truly,
Rachel Sullivan Age 8?
P.S. my Father gets your Magazine and likes it very much.
Seattle, Wash. 98103

The risk of loving your enemy

I thought the article on US and THEM (*WER* #49, p. 76) was very good. It brings to mind three ideas we teach in our own classes about "Turning Enemies into Allies" that might be useful to someone.

First, when we approach an "enemy," we try to offer solutions that are useful to the person on their own terms. If we would coach someone on requesting a company not to make a certain product, we remind the person that they have a better chance of success if they present the alternatives. Peace groups in San Diego, for example, are doing research to show industrial manufacturers that there is a market for their goods in nonmilitary markets. Simply asking someone to take a loss — whether it be financial or spiritual — because you believe what they are doing is not right, is often not enough.

Second, if you truly open up your heart to the possibilities of seeing your enemy as a human being, you open up yourself to the interesting danger of having your own mind changed in the process. Many people approach the enemies-into-allies process with some self-righteousness and what I believe is a condescending attitude. I have done that myself, often in the unconscious attempt to ward off new knowledge. The more I have been able to tolerate diversity and the ambivalence of the universe, the more I have been able to approach my enemies with the courage to realize that part or all of what they stand for might be right. We encourage our clients to approach their "enemies" with the idea of learning a new point of view, not simply trying to change them. Otherwise, any talk of a dialogue is hypocritical.

Finally, we don't think it is a problem to approach difficult situations without the rush of self-righteous anger. I believe most activists get physiologically addicted to their own adrenalin, which is why we read stories (some printed in these pages) about people in movements who refuse to negotiate with their enemies. It is more terrifying for some to face a world devoid of a purposeful feeling created from their own glands than to actually solve the problem at hand and move on.

One of the premises by which we run our business is that we all live on the same planet, and it is very hard to kick people we don't like off the planet, and, when we are involved in conflict, we should try to act as if our goal is to not only solve the problem but to prepare for the day we will live in peace with the people whom we are currently fighting.

Pat Wagner
Denver, CO

Secret tax folklore

My guess on the (U) Jewish Secret Tax ("Urban Legends," *WER* #48, p. 124). It does take extra effort on the part of the manufacturer to obtain the (U) certification that the product is kosher. Thus the label may refer to the corresponding extra cost of manufacturing.

Daniel Kegan
Chicago, IL

The Farm: a package deal

Just as when I joined the Farm, I still long to live a seamless life of total conviction. It would be so efficient — with every vector in my body pointing in the same direction, I could unleash my full power on the world. That power would be greater than what I can unleash when parts of me are pulling in different directions.

Ever since I left the Farm I have more internal contradictions and less absolute truths. Doubt is frustrating.

The Farm was a package deal — solutions and seamless existence. We had an answer for every one of the world's ills and we tried to live every moment by our principles. I think far more people came to the Farm like I did for this package deal than came for the free room and board.

Total conviction appears to be something like magnetism. The more consistently polarized and aligned the molecules of a magnet, the more powerful it is. The Farm's experimental medium was a magnet made up of many people homogeneously aligned; we generated a powerful magnetic field — so overwhelming was its power that it quickly became almost impossible for anyone inside or outside the community to adjust our alignment or orientation.

All 1500 plus of us denied the failings of the community for so long because we were over-committed to our working solutions. We wanted the Farm to work so badly that we each learned to distrust our intuition when it told us it wasn't.

So to be powerful in the world you need conviction; to be any more than a notable but isolated force in the world you need a movement of people with common convictions — the more people and more conviction the more powerful. But as the Farm experiment demonstrates, too much homogeneous conviction leads to inflexibility and weakness.

Is it possible to have a movement that doesn't overdose on inbred conviction?

I'd like to think that I left the things that went wrong with the Farm back on the Farm — that Stephen hoodwinked me and the soakers took advantage of me but that's all over now. To believe that would be self-deceit. Three years after leaving the Farm, I still find myself yearning for the euphoria that total conviction provided me. . . . So I approach magnetic movements more cautiously than I used to, and I doubt I will ever jump for another package deal.

Jeremy Sherman
Berkeley, CA

The Farm: a classroom

I left the Farm in 1984, although we really made up our mind to leave the Farm back in 1983. It took us about seven months to clean up our karma, as we used to say, and be able to leave the Farm. I didn't have any hard feelings; it's just that the Farm had changed from what it had been in the years past. The farm was a good experiment but I think it was a mistake to think of it as a permanent lifestyle. I think that the original idea of the Farm was as a school. You would go to learn something at the school and then graduate and go on with

your life. As a school, it was the right attitude. But somehow or another many of us got caught up in the idea and saw it as a permanent sort of thing that would go on forever, one that we would all do, and that was really the mistake.

I still have my friends there, and I don't regret any of it. I really enjoyed it while I was doing it. But now I feel like I have a very clearcut vision of what I want to do. I can make my own budgets and make my own plans and if I fall on my face, it's my face and I won't drag down a few hundred other men, women and children with me.

Mark Long
Florida

The strength of fringes

To the folks who survived the Farm:

Speak truth to power, friends. Alternative Religion ran into the same problem as did Alternative Politics. Gurus took over, power structures were created, and original inspiration got smothered in an avalanche of sociopathology. Just as participatory democracy turned into chauvinistic irrelevance, spiritual enlightenment turned into megalomaniacal opportunism. But Power not only corrupts; it also exacts a high price. Finally, Gurus and Dictators sink from their own weight. . . .

Entropy rules. Gurus and Dictators speed up entropy; that's all. But our hard-won radical scepticism should not become cynicism. Life will find ways to struggle against the grain of entropy. Entropy is strongest at the center of any establishment, political or spiritual. Get away from the center. To be in touch with the purest nuances of any movement, go out to the edges, where doctrine has not yet piled up, away from the Gurus and Dictators. Into the desert, if necessary. . . .

And do unto others as you would have them do unto you. The rest is just commentary.

Carry on.

Snuffy Smith
Covington, LA

Another failed Tennessee commune

Far from being the unique grand experiment the former participants seem to think it is, the Farm is only the latest in a long line of failed Utopian Communal Societies that have been established in Tennessee. The Farm's closest spiritual predessor was The Community of Ruskin founded on socialist principles in the 1890s by a man named Julius Wayland.

A complete analysis of Ruskin and some of its predecessors is found in a rather slim book called *Visions of Utopia, Nashoba, Rugby, Ruskin and the New Communities in Tennessee's Past,* published by the University of Tennessee Press, 1977, ISBN 0-87049-213-6.

Pity it wasn't published before Stephen founded the Farm!

Harold Satterfield
Bradville, TN

Gringo prisoners in Peru

We represent a large group of foreign tourists and young travellers who are detained at Lurigancho prison in Lima, Peru; the majority are falsely accused of being alleged "drug traffickers" and linked to ultraleft guerilleros.

Many of us have been set up by police officials who are heavily involved in drug trafficking, who have tortured us, stole our personal belongings, and work together with a group of "lawyers" to extort sums of over U.S. $20,000 — in some cases for allegedly necessary payments of bribes.

Lima has become one of the most dangerous places in the world for a foreign visitor because he could find himself in a situation where he may have to face an ordeal of 5, 10 or more years in a prison of Dantesque conditions in the desert.

The incredible bureaucracy and slowness of the corrupt judicial system, with its successive frauds applied, again by crooked lawyers, have not only robbed us and our families of money, but also any hopes ever to see our homes again.

The situation of a foreign inmate waiting years for trial in a strange country, not knowing its customs and language, is highly desperate, to be compared as in a novel of Franz Kafka, because none of us has any family in this country and the next relative or friend is many thousands of miles away.

Prison conditions are unimaginable: 60 per cent of the general population of over 6,500 suffer from tuberculosis, typhoid, and other diseases; medical attention is available only against payment; water just three quarters of an hour daily, but non-potable; indescribable hygienic conditions, since prison maintenance and supplies are nonexistent since its inauguration (1974); no work or recreational facilities, the only alternative is almost unlimited amounts of drugs (cocaine, marijuana, etc.) that are dealt freely inside the prison.

Absurdly enough, a law passed in November 1983 forbids drug offenders arrested after that date to work and denies them any benefits like obtaining conditional release because of good conduct and work-time-credits.

Considering the fact that the standard sentences for foreigners range between 10 and 15 years, it is little wonder that many of us leave this place after many years as drug addicts, sick, under-nourished, desocialized and sometimes even insane.

Who has had the bad luck to be involved in a drug case in Peru is declared a "dangerous criminal," who is not to be granted any more rights.

We as foreigners pointedly denounce this unbearable situation, and appeal to the public opinion in Peru and the world, the news media, press and Human Rights Organizations to visit Lurigancho to determine the cruel circumstances we are facing!

There are more than 110 foreign prisoners of 29 nations detained in here, of which 81 per cent are waiting for trial, some since 1980, and this fact should justify establishing an international body, in order to examine each of our cases, with the purpose of resolving the judicial process in due time, of obtaining benefits and assuring our health, constitutional and human rights!

We remain, in anticipation of your assistance,

THE COMMISSION OF
FOREIGN INMATES
P. O. B. 11-49
Lima 100 Peru

Swiss army knife service

Darrin Peter De May's backscatter letter in *WER* #46 (p. 107) concerning the lifetime guarantee and servicing of VICTORINOX Swiss army knives inspired me to pursue getting my trusty 24-feature "Champion" model refurbished.

I had carried (and used) this knife daily since 1978 when it was purchased to replace an earlier Victorinox Swiss army knife I had carried since 1973, when it was stolen. These knives are the greatest thing since shoelaces!

The red plastic sidewalls of my knife had begun to crack, and the knife showed its age in wear and tear. I'm delighted to report that Victorinox sent me a brand new replacement by return mail — demonstrating a level

of service consistent with the quality of their knives.

The very important piece of information I would like to contribute to Mr. De May's letter is that it is not necessary to take the time and trouble of shipping knives all the way to Switzerland for servicing. Victorinox has a domestic facility which handles such service:

VICTORINOX of Switzerland, Ltd.
P. O. Box 846
Shelton, Connecticut 06484-0913

Warren A. Potas
Washington, D.C.

Library exposure

I subscribe to only two magazines, *WER* and *Sun*. For several months I read them at the library when I could find them there, then I finally broke down and subscribed. I believe that there are a lot of people like me out here in this regard, i.e., expose them to the magazine enough and they'll be hooked. How to expose them at minimal expense?

Prepare small posters, free standing or not, something to the effect that I've sketched at right. These could be distributed to libraries by your subscribers who would go to the libraries in their local communities and ask the librarian to put the poster where it would be readily seen by the patrons.

For instance, there are about 20 libraries in my vicinity (counting branches) and I'd be happy to contact each of them. As an example, in the Ojai valley, there are three libraries. One of these carries the Sun; none carry *WER*.

By the way, I'm also going to send this note to the *Sun*, which also suffers. Would it be possible for the two of you to work together on this?

Greg McMillan
Ojai, CA

Fine idea. We'd be happy, Greg, if you did contact those branch libraries.

We also have an emerging Library Fund. Readers who live in areas where nearby libraries do subscribe to WER *are invited to contribute to the fund: we'll pass the gift to a library that would like to subscribe but can't afford to.* —KK

HELP YOUR LIBRARY

(and a lot of your friends)

Donate to the Library a gift subscription to WHOLE EARTH REVIEW (a wonderful magazine).

See it in our Periodicals section.

We can record it in your name.

Workers Trust retains honor

In your most recent issue, there appears a letter headlined "Misgivings about Workers Trust" (*WER* #49, p. 137). Unfortunately, the writer, Mr. Doug Hornig, has mistakenly identified Workers Trust as the organization which declined his insurance application and caused him so much distress.

The facts are: Mr. Hornig never applied for health insurance through Workers Trust, nor have we ever had any communication with him except just recently, and then only to confirm that his letter was in error. (Doug now freely admits that all his correspondence was with another organization and that his identification of Workers Trust as the source of his problems was the result of honest confusion [confirmed by *WER*].)

Apparently what happened is that Mr. Hornig read your article praising Workers Trust (*WER* #45, p. 103) and sought more information about the health insurance plan. For whatever reasons, he ended up making an application instead to an organization called Coop America for health insurance. All of Mr. Hornig's difficulties which proceeded resulted from his interactions with Coop America and their plan underwriter and administrator — Consumers United.

Your readers should be aware that Workers Trust and Coop America are entirely separate and independent organizations. It is true that both organizations, which are national associations, purchased insurance through Consumers United, which is an insurance company. However, as of December 31, 1985, Workers Trust and Consumers United no longer do business together.

It was particularly frustrating to us to see our name so prominently identified with Mr. Hornig's difficulties with the Coop America/Consumers United underwriting process because his experience could not have occurred had he actually been applying for the Workers Trust health plan. It has been our policy to purposefully refrain from the use of the underwriting process Mr. Hornig calls "healthy participant discount," sometimes referred to as "healthy lifestyle discounts" or "non-smoker rates." Workers Trust does not employ this underwriting technique because we feel it inevitably leads to subjective decisions and the kinds of negative client interactions Mr. Hornig relates in his letter.

It is our understanding that the normal industry practice of "healthy lifestyle discounts" simply involves establishing the percentage of insurance applicants who will say they don't smoke, whether they do or they don't, the percentage that say they exercise three times a week, again whether they do or they don't, and then establishing the premium offset caused by these discounts and, finally, increasing the composite premium to all buyers to make up the difference. As far as Workers Trust is concerned this is all just so much "voodoo" underwriting.

In defense of Coop America/Consumers United, underwriting, by its nature, is a discriminating process often leading to decisions not popular with the consumer, but a process necessary to the long term "healthy" of any health insurance plan. As far as awarding people with healthy life styles lower premiums, it's a great idea, but a very difficult policy to administer as Mr. Hornig can now testify.

Workers Trust has a five-year history of outstanding service to its members. Our health insurance plan provides a broad range of traditional as well as alternative medical coverage. We provide all our plan participants with a health promotion program hoping that all will make progress in establishing more healthful lives. We have managed, over the years, to keep our premiums low with a minimum of arbitrary risk assignments, and a maximum of prudent plan management.

While I can't say Workers Trust has never made an unpopular decision, or had a disgruntled customer, Mr. Hornig, while he may be disgruntled, was simply not our customer. We just hope more people will read the wonderful things Whole Earth said about us in issue #45, and forget this case of mistaken identity.

Richard Koven
President of Workers Trust
P.O. Box 11618, Eugene, OR 97440

The UNCLASSIFIEDS are a reader-to-reader service available to ***WER*** subscribers only. They're designed to provide a cheap communications network for ***WER*** readers and mild financial assistance to the magazine.

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MATE (FEMALE) WANTED. I am a 33-year-old male, raised in the Jewish intelligencia tradition. Interests include folk music, glassblowing, technology, literature. I have an inquisitive attitude towards the world around me. My professional training is as a metallurgical engineer. I live in Chicago, work for a successful consulting firm in the west suburbs. My friends describe me as warm, bright, impatient, funny, curious, demanding and quick. I describe myself as sensitive, intense, somewhat demanding, giving, prompt. I am fairly well settled; five years with same car, apartment and job. I dream of building a glassblowing studio. I suspect that the companion/friend/lover I end up with will be confident of who she is and where she is heading, willing to deal with her feelings and to put effort into a relationship. It wasn't particularly easy to write this, if you are interested I hope you can find the resources to reply even if it isn't easy for you either. Zvi Flanders, 1937 West Schiller, Chicago, IL 60622.

I HAVE MULTIPLE SCLEROSIS and want to find people interested in alternative healing and inner growth to work and play with. John O'Neil, Box 182, Bradford, NH 03221.

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PART-TIME BUSINESS for sale. The Natural Messages Company publishes sales aids for natural food stores in the form of recipe pads and information sheets in pads. Stores all over the country have been using them since 1972. It's been my pride and joy for 14 years, but now I'm moving on to other ventures and would like to find a good home for it. It can be operated from an extra room or two in one's home and can provide a substantial part-time income (about $5,000 — 15,000 per year) for a reasonable expenditure of time. Some knowledge of small-scale publishing, advertising, and small business operations is helpful, as is an interest in the natural foods industry. Asking price mid-teens. Jim Guinness, 4 Ridgeway Terrace, Newton, MA 02161; 617/965-4414. Serious inquiries only, please.

LAUGH IN THE FACE of insanity. "The Realist" is back. Paul Krassner published from 1958 to 1974 what Library Journal called "the best satirical magazine in America," although Harry Reasoner wrote that "Krassner not only attacked establishment values; he attacked decency in general." Now Paul Krassner has launched "The Realist" as a newsletter of social and political satire. Issue #100 features Robert Anton Wilson's coverage of the married priests' convention and an interview with a terrorist's family. Subscriptions: $23 for 12 issues; The Realist, Dept. WE, Box 1230, Venice, CA 90294. The time has come to attack decency in general once again. The taboos may have changed, but irreverence is still our only sacred cow.

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ANNE HERBERT of "CoEvolution Quarterly" said, "THE SUN tries to print the truth. Not the news or the latest, but the truth, Mr. Truth, the Queen of All Our Dreams. And it does." The poet Robert Bly said, "In this age of decrepit and impersonal magazines, THE SUN seems to me personal and alive." The spiritual teacher Ram Dass said, "THE SUN grounds me when I get too spacey and helps me to fly when the ground gets too real. Who can ask for a better friend than that?" Since 1974, THE SUN has sorted through the chaff of "New Age" thinking to get to the heart and soul of humanity. Each month, in essays, interviews, humor, fiction, photographs and poetry, THE SUN looks at the passions that move us and the fears that weigh us down. People write in THE SUN of their struggle to understand their own lives, often baring themselves with remarkable intimacy. THE SUN asks a lot of its readers: self-honesty, thoughtfulness, the willingness to live with questions instead of answers. To subscribe for six months, send $15 to THE SUN, Dept, WE., 412 West Rosemary Street, Chapel Hill, N.C. 27514. And, for a copy of the just-published "A Bell Ringing in the Empty Sky: The Best of the Sun, Volume I," an anthology of the finest writing from the magazine's first ten years — including Robert Bly, Reshad Feild, Thaddeus Golas, Ron Jones, Tuli Kupferberg, Ram Dass, Patricia Sun and other less known but equally compelling voices — send $12.95 plus $1.50 for postage and handling, or a total of $14.45, to the same address.

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DEATH IS MORE than dying. Poet Harold Otey greets and explains his sojourn into this vast unknown. Two chapbooks "and me i am like the leaf" and "singing for mooncrumbs" ($5.00/set). Write: Bench Press, 332 N. 4th, Seward, NE 68434.

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TO CELEBRATE 11 years in business, we offer WER readers one free use of our information service until January 1, 1987. Call our office (no written requests — sorry) between 10am and 5pm MST weekdays with your question, problem, opportunity, vision, etc. We will try to be immediately useful with contacts or an information strategy. No guarantees and no collect calls. No catch, either. Our success rate is around 95% — can you stump us? Pat Wagner and Leif Smith — 303/832-9764. The Office for Open Network, Box 18666, Denver, CO 80218.

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WHOLE EARTH REVIEW has begun a library fund at the suggestion and contribution of Milo Jarvis. This fund will provide libraries with one-year gift subscriptions to WER, giving WER much-needed exposure. If you would like to contribute to this fund, you can send your contributions to WER Library Fund, 27 Gate Five Road, Sausalito, CA 94965.

GATE FIVE ROAD

Point/Whole Earth Consolidated Report

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Mailing List	14,724	Production	39,742	Telephone/Networks	5,600
Software Catalog sales	14,445	Circulation	9,153	Postage	3,488
Direct Distribution	17,181	Office	8,133	Auto/Travel	177
National Newsstand	33,268	Research	5,554	Promotion/Publicity	155
Syndicated Column	11,885	Payroll Taxes/Benefits	3,130	Building Rent/Maintenance	
WESC film reimbursement	30,000	Writers/Contributors	17,241	Utilities	15,287
NETI/WELL	5,790	Supplies/Research	6,306	Legal/Professional	20
EWEC Advance	51,000	Magazine Printing	62,202	Interest/Bank Charges	2,668
Best of CQ	2,500	Subscription Promotion		Miscellaneous	
Contributions	13,927	and Fulfillment	29,302	Operating Expenses	4,144
Interest	1,235	Direct Distribution	2,770		
CompuServe	746	National Newsstand	6,215	**Total Expenses**	**257,133**
Unclassifieds	3,745	Mailing List Fulfillment	1,531		
Miscellaneous	695	Software Catalog Fulfillment	5,589		
Total Income	**347,282**	Syndicated Column	8,295	**Profit/Loss**	**90,149**

August, September, October, November, and December 1985

WEAL 1985

(Whole Earth Access Link, a joint venture of Point and NETI)

INCOME		EXPENSES	
NETI Advances	90,000	Salaries & Fees	57,371
WELL	36,417	Maintenance	19,475
Other	1,235	Insurance	1,050
		Office	14,124
		Selling	1,820
		Financial	721
		Other	1,826
Total Income	**127,652**	**Total Expenses**	**96,387**

Profit/Loss 31,265

"Or Whole Earth Access"

That phrase under access information in the ***Whole Earth Review*** means you can mail order the item from the Whole Earth Access store. *Do not send orders for books to* ***Whole Earth Review***. Send orders to:

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Add $2 per order to the total retail price. Rush orders U.P.S. (Continental U.S.): 40 cents additional charge per book. Foreign orders (surface mail): Add $3.50 per order for insurance if desired. Pay only in U.S. funds drawn on a U.S. bank. California delivery: Add 6% tax (BART counties add 6½%). VISA/MasterCard orders accepted.

Recent WER mailing list renters:

The Utne Reader, Planned Parenthood, Good Money Newsletter, Union of Concerned Scientists, PC Magazine, Harrowsmith Magazine, Smith & Hawken, New Age Journal, People's Medical Society, Amnesty International, DEVA, International Fund for Animal Welfare, The Nation, Worldwatch Institute.

Back Issues/Further Issues

The quickest way to order back issues of this magazine is not from us but from Whole Earth Access (see address above). Each ***WER*** back issue is $3 for issues #44 — #47 and $4.50 for #48 on, postage paid. ***CoEvolution Quarterly*** issues are $3.50 each, postage paid, or $10 for four. All 29 available ***CQ*** issues are sold as a set for $35, postage paid.

Subscriptions to ***Whole Earth Review*** are $18 for one year (4 issues) and $33 for two years (8 issues). Foreign rates are $22 for one year and $41 for two years. Send your order with payment to: ***Whole Earth Review***, P.O. Box 15187, Santa Ana, CA 92705.

Gossip

Our grandfatherly 50th issue here. We cooked up two devices to put the previous 49 issues into perspective. The first is a best-of-**CQ** book entitled **News that Stayed News: Ten Years of CoEvolution Quarterly**. Edited by Art Kleiner and to be published by North Point Press, it's sort of a sampler of the best articles **CoEvolution** ever ran (no book reviews). If you have trouble describing what **CQ/WER** is, as we often do, you might hand the innocent this book. (More details next issue.)

Coinciding with the book's publication date in April, Marin Civic Center will host an evening billed as "News that Stayed News: An On-Stage Discussion of Ideas from CoEvolution Quarterly." On stage will be Ken Kesey, Gary Snyder, Paul Hawken, and Stewart Brand, all regular **CQ** contributors. At front stage we hope to have regular **CQ** readers. Across the stage should be a wide-open, deep-ranging conversation of ideas stirred up by past issues. Peruse your back copies for possibilities. Tickets are $8 and $10 at the Marin Civic Center, San Rafael, CA on Saturday, April 12.

Late last year we went to New York's publishers' row with a proposal to do a **Whole Earth Travel Catalog** and came back instead with a contract to construct the **Essential Whole Earth Catalog**, something we've wanted to do for a while. "Essential" in this case means the best of the best, and the best of the new, evaporated down into a portable 8½ x 11 trade paperback. "Whole Earth" means it will be a hefty 416 pages. It will be different from previous catalogs in its bold selectivity, and its triply-distilled brandy of researching/publishing/researching from these past 18 years.

Of course it will be impeccably updated, a major undertaking. The most disheartening curse so far is that a sorry number of essential books are out of print. For example, all nine of the books from Rodale press whose merits we trumpeted in **The Next Whole Earth Catalog** have been allowed to lapse out of print. Grrrrrr.

Jay Baldwin is in charge of the brew. Since his Airstream trailer home is parked 60 miles north of here, he's camping out in the offices during the week. He hired Jeanne Carstensen away from Planet Drum Foundation to manage the production and divert panic. As usual we depend on and pay for suggestions for essential, quintessential items. Experts in particular domains are also wanted. The best way to contribute is to write in, addressed to Jeanne Carstensen.

The new catalog work is slowing down Donald and Susan Ryan's housebuilding. Ever the optimists, they hope to get a good start on their barn-shaped compact house by summer.

Back on his micro-farm, general purpose clerk Dick Fugett finally got around to a massive felled oak log that he had sawn into boards two years ago. The planks have been patiently drying, awaiting their transformation into kitchen cabinets. Dick, a book-taught, first-time cabinetmaker, says they're coming out great.

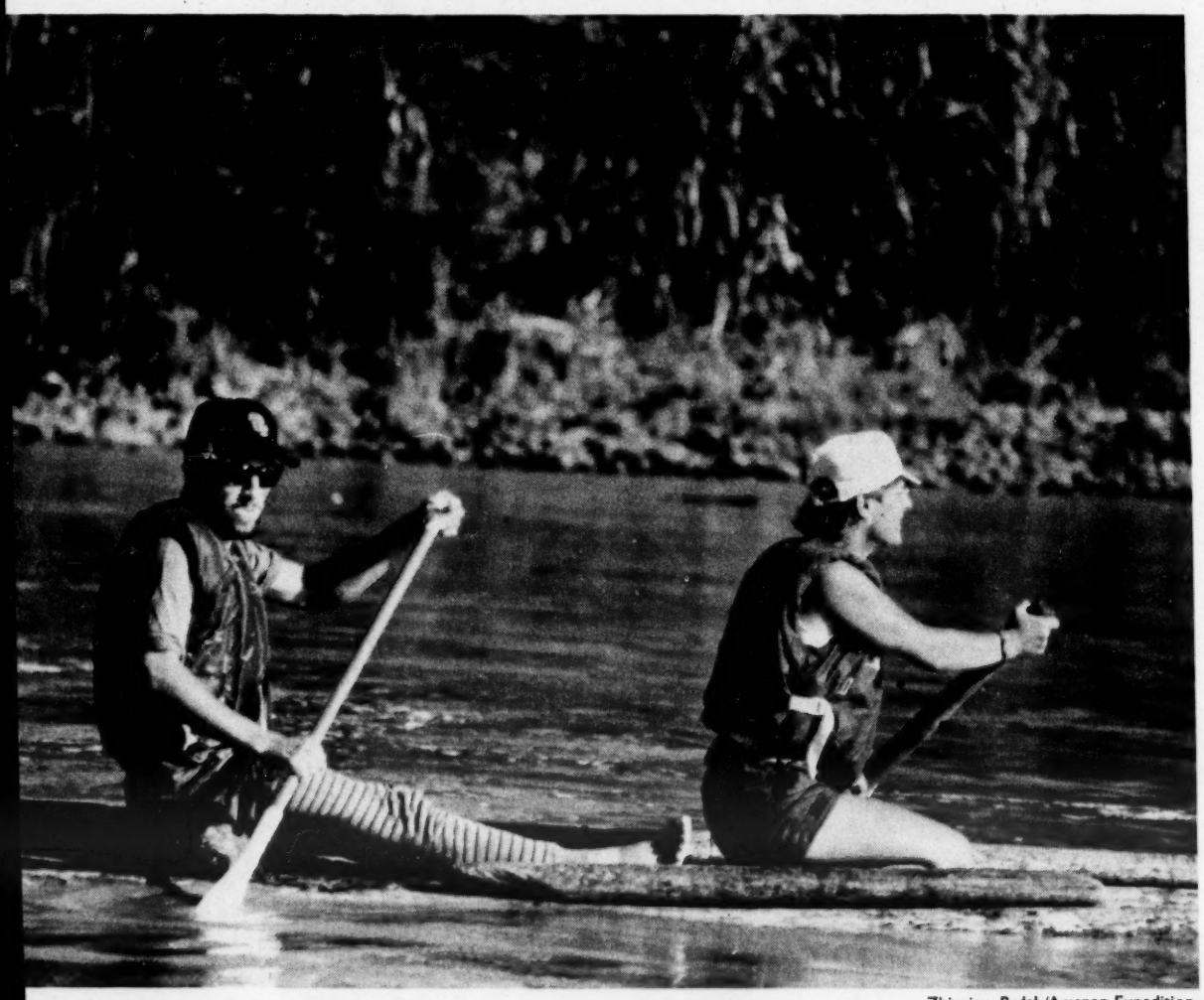
The magazine's off/on schedule is a blessing to Hank Roberts, our part-time proofreader who spends much of his off-time aloft in a hang glider. He's been refurbishing his 1983 model with new wing tips and center post. The long contraption is, remarkably, carried atop his VW bug on a homemade stretcher.

Former copy editor Ted Schultz went back to college (he was last there eight years ago) to become a straight-A biology undergraduate. Much to our gratitude, he gave up his winter break to come back, compile the 1985 index and do paste-up. I, too, am a student again after a 15 year pause. Every morning I catch an 8 o'clock morning class in Chinese at the local university. Dzau! Ni hau ma?

Collegiate discipline must be in the air. Stewart Brand spent the winter teaching a course on media at MIT, in snowy Cambridge, Massachusetts: "Long ago I pledged to myself that I would never teach. Gee, I wonder what else I promised that I would never do?"

Last seen in Peru, Joe Kane sent word from his source-to-mouth Amazon expedition somewhere in Brazil. "Should I start with the night I woke up with a snake on my face? One of us was pretty scared . . . Or the time we were shot at and captured by Maoist guerrillas? They had submachine guns, nervous twitches, and us. We had five cans of tuna fish. We worked them to a draw.

"Or the night we unknowingly



Zbigniew Bzdak/Amazon Expedition

Joe Kane (left) paddles in the slow stretch with partner Kate Durrant.

Gary Pickett/Networking Journal

camped next to a plane wreck that held a half-ton of coca paste? The owners watched us fron the bushes, paralyzed, figuring we were cops, mafia, or so completely pig ignorant that we were truly dangerous.

"Ah, but it's all anticlimax, for the current word is this: we're alive, we're safe, and we're about six weeks from becoming the first people to travel the Amazon from source to sea. It's taken almost four months to cover the first 1500 miles, in part because we're doing it the hard way: entirely under our own power, by foot, raft, and kayak."

For the rest I guess we'll have to read his book. —*Kevin Kelly*

Update

Price changes updating information in last issue: Plaited Basketry (p. 126) is $19.95 postpaid. Cerulean Blue's catalog of dyestuff (p. 124) is not free as we erroneously reported, but costs $3.25. Neptune Fireworks Catalog (p. 127) is $1 refundable with purchase. The publishers of "The Small Business Legal Problem Solver" (p. 105) have moved to CBI Publishing, 7625 Empire Drive, Florence, KY 41042. Mail to their old address will not be forwarded.

for Contributions (Literary, not Financial)

I am compiling a special section of ***Whole Earth Review*** *on "The Culture of Marketing and the Marketing of Culture." It is based on the premise that the habits and values of marketing and salesmanship influence our world in ways that are generally not noticed. This section is a way to notice them in print. If you have an article, idea or review that fits this theme, please write me:*
Art Kleiner
c/o Whole Earth Review
27 Gate Five Road
Sausalito, CA 94965.
For long articles, please query first. Deadline: May 1.

Welcome to the WELL

The WELL (Whole Earth 'Lectronic Link) is a low-cost teleconferencing system jointly sponsored by Point Foundation and Network Technologies, Inc., of Ann Arbor, MI. Physically, the network lives in a minicomputer at the Whole Earth offices in Sausalito. But anyone, anywhere, who has any kind of personal computer with a modem attachment can call us up to exchange comments and messages with our other 1300 users.

Even though you can "chat" on The WELL in real-time, most information is exchanged within conferences where you post and read comments on your own schedule — The WELL is open 24 hours a day. There are now 120 active conferences on everything from various kinds of computers (especially the newer ones) to spirituality, legal questions, and sexuality. Increasingly, The WELL includes previews of material eventually published in ***Whole Earth Review****. Last issue's "Islam" and "Automobile" sections grew out of WELL conferences.*

Although it's primarily a regional system, people from outside the San Francisco Bay Area can reach The WELL at discount rates via Uninet, a national networking service. Uninet serves the entire U.S. You dial a local number in your area and it switches you into Sausalito. If you live out in the genuine boonies you may have to pay a message-unit charge to reach the local node.

With low-cost national access to The WELL, we hope to have more Bay Area groups with national constituencies bringing their branch offices online as an inexpensive way of coordinating efforts. One group — the Big Mountain Legal Defense/Offense Committee, which is organizing support to resist the forced relocation of thousands of traditional Dineh (Navajo) people by the Federal government in July — has done just that. Telecommunications as political tool.

How much does it cost? Uninet's rate during non-prime time (evenings and weekends) is approximately $4/hour for phone access. A subscription to the WELL costs $8/month plus $2/hour. Your online charges from, say, New York would be $6/hour. That compares favorably with the other teleconference systems (e.g., Source $10.75; Compuserve $12.50/hour at 1200 baud). A simple long-distance phone call at night rates is about $10/hour. To find your closest Uninet access number, call customer service at 800/821-5340 or 800/221-2444.

For more WELL information, contact me at 415/332-4335, or use your modem to sign up by dialing 415/332-6106. Just answer the questions, and you're in The WELL. —*Matthew McClure*

Dearly Beloved

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All contributions are tax-deductible because we're a nonprofit foundation.

1985 Index *Compiled by Ted Schultz*

Key: Covers *WER* issues numbers 45-49. Books and movies are *italicized,* subjects are **bold,** and software is CAPITALIZED.

Our published knowledge has outgrown our collective memory. Time was, not too long ago, when someone on the staff could remember if and when we had reviewed an item, or who had written a particular article. Several times a day we get phone calls begging for such answers. With 50 issues now, we can only shrug five times out of ten. A cumulative index would cure all embarrassing absentmindedness.

Ted Schultz hacked out a computer database that sorted this 1985 index. It costs $50 an issue in labor to enter the data. We'll be creeping backwards, retroactively indexing back issues into one continuously-updated databank, as money permits. We hereby solicit money. Readers contributing $50 or more to the Index Fund will receive a xerographic copy (about 150 pages) of the complete cumulative index of CQ/WER *issues 1 through 50, when it's done.* —*KK*

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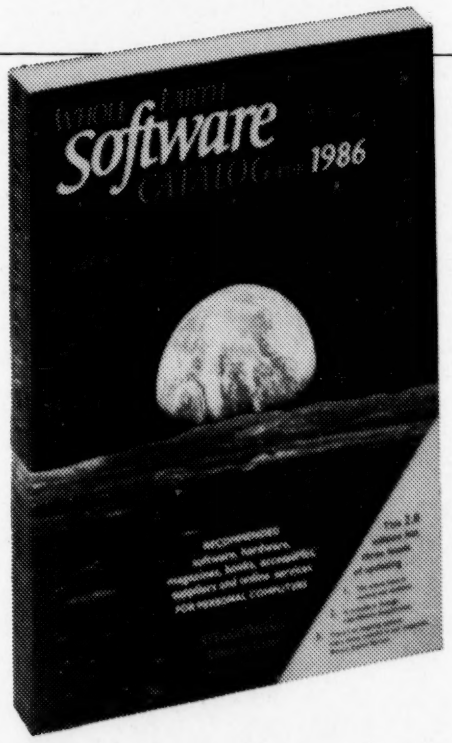

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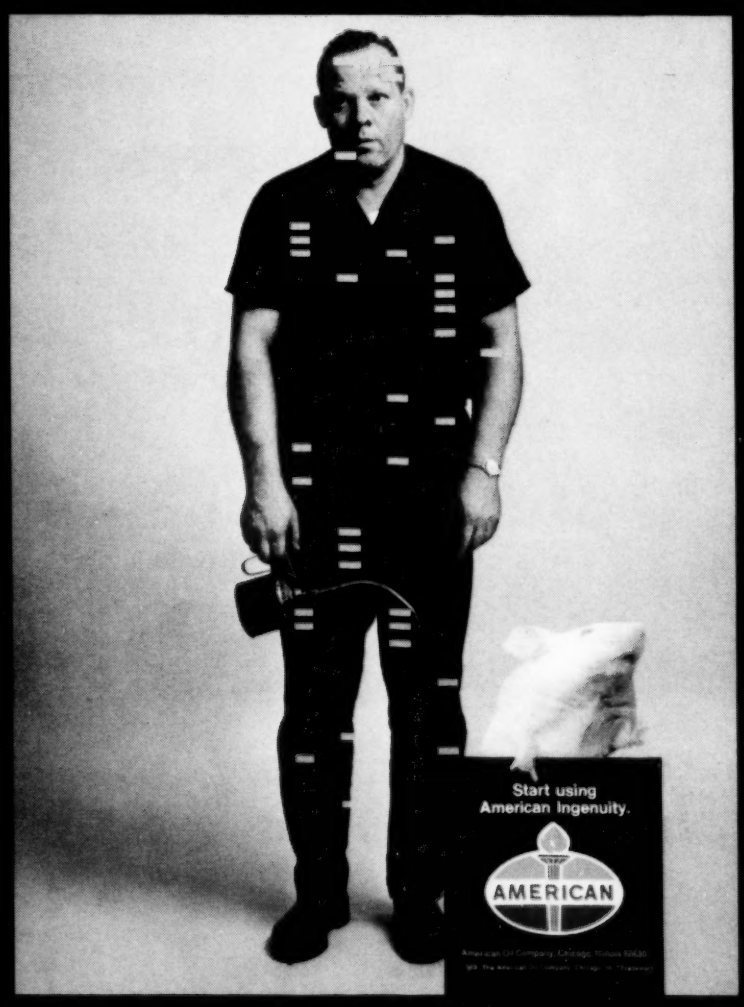

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Sure, we know our Chiquita Brand Bananas don't always look like the waxed version in the ten cent store.

Frankly, we don't expect them to.

But we do expect them not to be overly speckled. Or dry. Or skinny. And we'll throw out a whole tree-full if they're like the one below.

The way we see it, the Chiquita Brand Banana seal belongs only on our best. On the pick of the crop, not the run of the crop. On the plumpest, tastiest, sweetest bananas we've got it in us to produce.

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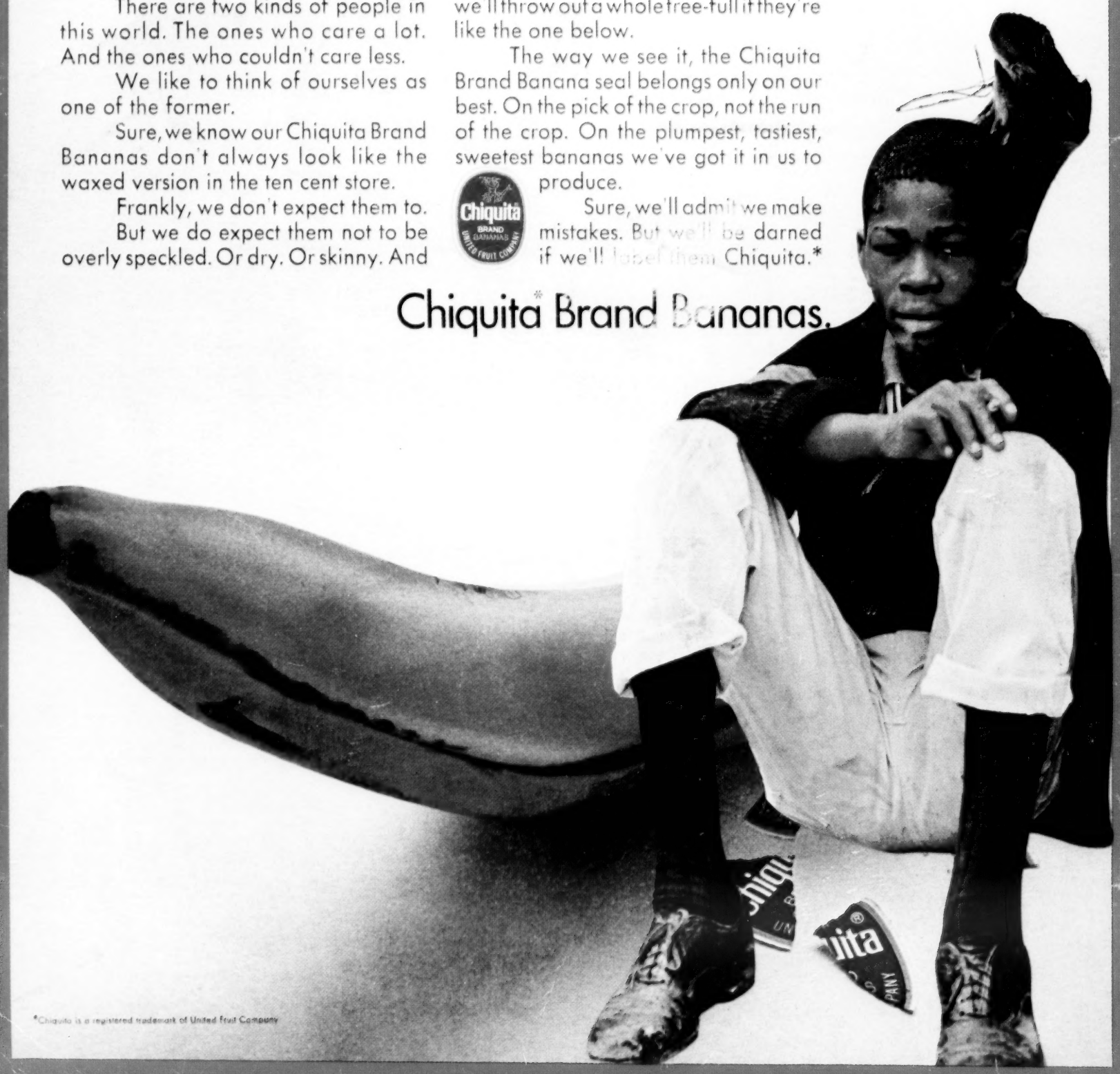

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